

F
630.9914
P538a
1938

**ANNUAL REPORT OF THE
SECRETARY OF AGRICULTURE
AND COMMERCE**

1938

135

DEPARTMENT OF AGRICULTURE AND COMMERCE
COMMONWEALTH OF THE PHILIPPINES

nd
ANNUAL REPORT OF THE
SECRETARY OF AGRICULTURE
AND COMMERCE

1938



MANILA
BUREAU OF PRINTING
1939

65 6318
F
630.9914
PS38a2
1938

DEPARTMENT OF AGRICULTURE AND COMMERCE

BENIGNO S. AQUINO

*Secretary of Agriculture and Commerce **

(From November 26, 1938)

JOSE S. CAMUS

Under Secretary of Agriculture and Commerce

ARTHUR F. FISCHER

Adviser on Natural Resources

HILARION S. SILAYAN

Director of Plant Industry

GREGORIO SAN AGUSTIN

Director of Animal Industry

FLORENCIO TAMESIS

Director of Forestry

JOSE P. DANS

Director of Lands

ANGEL S. ARGUELLES

Director, Bureau of Science

ANASTACIO DE CASTRO

Acting Director of Commerce

MIGUEL SELGA

Director, Weather Bureau

QUIRICO A. ABADILLA

Director, Bureau of Mines

MARIANO GARCHITORENA

Manager, Fiber Inspection Service

ANTONIO PEÑA

Chief, Division of Statistics

Department of Agriculture and Commerce

EDUARDO R. ALVARADO

Chief, Division of Publications

Department of Agriculture and Commerce

VICENTE C. RAMOS

Department Technical Adviser

RUPERTO T. MARTINEZ

Chief Attorney

CORNELIO V. CRUCILLO

Technical Assistant

N. VALDERRAMA

Department Chief Clerk

* From January 1 to November 25, 1938, Hon. Eulogio Rodriguez was Secretary. Hon. Mariano Jesus Cuenco was Acting Secretary from June 22 to August 7, 1938, while Secretary Rodriguez was on a tour of duty abroad.

TABLE OF CONTENTS

	Page
INTRODUCTION	9
THE AGRICULTURAL AND TRADE SITUATION	11
RESEARCH	14
INDUSTRIALIZATION	17
LOCUST SITUATION	17
SOIL SURVEY	18
DEVELOPMENT OF MINDANAO AND SULU.....	21
THE JOLO LAND PROBLEM.....	24
TEMPORARY PERMITS TO MINE AND EXTRACT ORE.....	27
PROTECTION AND CONSERVATION OF GAME AND BIRDS.....	29
CAMPAIGN AGAINST DUMMIES.....	30
THE CASE OF THE SAN JOSE ESTATE.....	30
APPEALED CASES DISPOSED OF.....	31
LEGISLATION	33
ORGANIZATION AND CHANGES IN PERSONNEL.....	35
ACTIVITIES OF BUREAUS, SPECIAL DIVISIONS, AND BOARDS UNDER THE DEPARTMENT	37
Bureau of Plant Industry.....	37
General Climatic Conditions Affecting Crops.....	37
Plant Sanitation Activities.....	37
Plant Investigation Activities.....	38
Agronomy	38
Horticulture	38
Tobacco Research	39
Fiber Research	39
Plant Utilization	39
Agricultural Engineering	40
Entomology	40
Plant Pathology	40
Plant Breeding	40
Los Baños Economic Garden.....	41
Plant Propagation Activities.....	41
Agricultural Extension Activities.....	42
Bureau of Animal Industry.....	43
Expansion of the Service.....	43
Eradication and Control of Animal Diseases.....	43
Meat Inspection	43
Veterinary Research Work.....	44
Laboratory Diagnosis	45

ACTIVITIES OF BUREAUS, SPECIAL DIVISIONS, AND BOARDS UNDER THE DEPARTMENT—Continued.

Bureau of Animal Industry—Continued	Page
Production of Standard Biological Products.....	45
Livestock Improvement Work	46
Stock Farms and Breeding Stations.....	46
Importation of Breeding Animals.....	46
Livestock Projects	47
Horses	47
Cattle	47
Carabaos	47
Swine	47
Sheep and Goats.....	47
Poultry	47
Pasture Grasses and Forage Crops.....	48
Experiments on the Preparation of Animal Products.....	48
Livestock Extension Service.....	48
Livestock Promotion Work in Mindanao and Sulu.....	49
Bureau of Forestry.....	50
General Survey	50
Lumber Industry	50
Investment	50
Foreign Markets	51
Local Markets	51
Scaling	51
Grading and Lumber Inspection.....	51
Utilization of Forest Products.....	52
Ordinary and Gratuitous Licenses in Force.....	52
License Agreements	52
Forest Products Cut, Collected, and Invoiced.....	52
Forest Charges	52
License Cash Bond Deposits and Fees.....	52
Land Classification	53
Forest Violations	53
Illegal Carrying	53
Special Use Permits.....	53
Rentals	53
Forest Land Registration Cases.....	53
Private Woodland Registration.....	54
Forest Claims and Conflicts.....	54
Forest Reserves	54
Timberland	55
National Parks	55
Communal Forests	55
Communal Pastures	55
Forest Research	55
Dendrology	56
Forest Entomology and Pathology.....	56
Botanical Collection	56

ACTIVITIES OF BUREAUS, SPECIAL DIVISIONS, AND BOARDS UNDER THE DEPARTMENT—Continued.

Bureau of Forestry—Continued.

	Page
Reforestation	56
Forest Surveys	57
Mapping and Drafting.....	57
Extension Service	58
Coöperative Planting Projects.....	58
Tagaytay	58
City Planting in Baguio.....	58
Mambucal Health Resort.....	58

Bureau of Lands

Administration of Public Lands.....	59
Public Lands Concession: New Applications.....	59
Approval of Applications.....	59
Issuance of Patents.....	60
Other Actions on Public Land Applications.....	60
Public Land Subdivisions.....	60
Public Land Investigations.....	61
Public Land Collections.....	61

Administrative Settlement of Claims and Conflicts over Public Lands

Decisions and Orders; Motions and Petitions for Re-consideration	62
Orders of Investigation and Reinvestigation.....	62

Administration and Disposition of Friar Lands.....

Sale of Vacant Lots.....	62
Sale Contracts	62
Assignments and Transfers.....	63
Deeds of Conveyance.....	63
Collections	63

Land Registration and Other Legal Work.....

Cadastral Proceedings (Acts Nos. 2259 and 3327).....	63
Compulsory Registration Proceedings (Sections 53 and 87 of Commonwealth Act No. 141).....	63
Claims and Requests for Amendment to Petitions.....	64
Examination of Ordinary Registration "Expedientes"....	64
Examination of Court Decisions, Orders, etc.	64

Isolated Land Surveys.....

Surveys Ordered to Public Land Surveyors.....	64
Survey Returns Received in Manila.....	64
Projection on Cadastral Maps.....	65
Computations on Isolated Land Surveys.....	65
Preparation of Plans.....	66
Work on Hand—Isolated Land Surveys.....	66
Surveys Finally Completed.....	67
Verification Fees for Surveys Executed by Private Land Surveyors	67

ACTIVITIES OF BUREAUS, SPECIAL DIVISIONS, AND BOARDS UNDER THE DEPARTMENT—Continued.

Bureau of Lands—Continued.	Page
Cadastral Land Surveys.....	67
Projects Inaugurated.....	67
Cadastral Projects in Progress in the Field.....	67
Cadastral Projects Completed in the Field.....	68
Computation of Cadastral and Public Land Subdivision Surveys.....	68
Cadastral Survey Maps.....	68
Progress of Cadastral and Public Land Subdivision Surveys.....	68
Cadastral Revolving Fund Collections.....	68
Collections of Cadastral Costs.....	68
Bureau of Science.....	68
Research.....	68
Industrial Chemical Research.....	68
Tanning and Manufacture of Leather.....	69
Vegetable Oils.....	69
Cellulose and Paper-pulp Industry.....	69
Forest Products (Copal Resins).....	69
Ceramics.....	70
Dyes.....	70
Miscellaneous Chemical Investigations and Other Researches.....	70
Industrial Microbiology.....	70
Fish and Game Administration.....	71
National Museum.....	71
Industrial Engineering.....	71
Scientific Library.....	72
Miscellaneous Service.....	72
Research Publications.....	73
Bureau of Commerce.....	75
Trade Information Service.....	75
Consumers' Cooperatives.....	76
Agricultural Cooperatives.....	76
Export Inspection Service.....	77
Certification of Current Commodity Prices.....	77
Marketing of Agricultural Products.....	77
Apprehension of Unfair Trade Practices.....	77
Registration of Corporations, Trade-marks, Trade names, Patents, etc.....	77
Promotion of Small and Household Industries.....	78
Commercial Extension Service.....	79
Weather Bureau.....	79
Typhoons and Depressions.....	79
Rain Stations.....	80
Aërological Stations.....	80
Earthquakes.....	80
Time Service.....	80
New Apparatuses.....	80

ACTIVITIES OF BUREAUS, SPECIAL DIVISIONS, AND BOARDS UNDER THE DEPARTMENT—Continued.

	Page
Bureau of Mines	81
Disposal and Administration of Mineral Lands.....	81
Surveys of Mineral Lands.....	81
Administrative Settlement of Claims and Conflicts over Mineral Lands	81
Geological and Mines Surveys.....	82
Assay and Metallurgical Work.....	82
Mining Examination and Valuation.....	82
Fiber Inspection Service	82
Convention of Abacá Planters.....	83
Fiber Grading and Inspection.....	83
Educational Work	85
Division of Statistics	85
Division of Publications	86
Board of Examiners for Surveyors.....	88
Organization	88
Meetings	88
Examinations	88
Certificates Issued during the Year.....	89
Veterinary Examining Board	89
Organization	89
Applications and Examinations.....	89
Registration	89
National Research Council	89
FINANCIAL STATEMENT	89
Department of Agriculture and Commerce.....	90
Office of the Secretary and Special Divisions.....	90
Bureau of Plant Industry.....	91
Bureau of Animal Industry.....	91
Bureau of Forestry.....	92
Bureau of Lands.....	92
Bureau of Science.....	93
Bureau of Commerce.....	93
Weather Bureau	94
Bureau of Mines.....	94
Fiber Inspection Service.....	94
RECOMMENDATIONS	95
ACKNOWLEDGMENTS	97



ANNUAL REPORT OF THE SECRETARY OF AGRICULTURE AND COMMERCE

December 31, 1938

His Excellency
The President of the Philippines
Manila

SIR:

Pursuant to the provisions of section 91 of the Administrative Code, I have the honor to submit the following report of the Department of Agriculture and Commerce for the calendar year 1938:

INTRODUCTION

65-63648
The changing Philippine economy has awakened public consciousness to the many complicated problems involved in our economic struggle. Our present problems are no longer confined to purely technical matters, such as the control of pests and diseases, effective means of cultivation, evolution of desirable strains of crops and breed of animals, the growth of individual farm business, and those other fundamental questions which have been more or less already threshed out by means of researches in the past, but involve primarily the practical application of fundamental principles already established. The growing complexities of economic problems not only here but in all parts of the world necessitate government intervention in the regulation of crop production and marketing, of factory outputs and of the movement of commercial products both in the local and foreign markets. The need has arisen for collective as well as individual planning in the development of agricultural enterprises, improvement of export

and domestic markets, establishment of credit facilities, and solution of other kindred problems. In this country, as elsewhere, the tendency has been for increased government participation in the activities affecting the development of a sound economy, among which may be mentioned the settlement of the vast areas of agricultural lands in the unsettled or otherwise sparsely populated regions of the country; the wise utilization and exploitation of our timberlands, fishing grounds, mineral and other natural resources with which the country abounds; the dissemination of scientific methods and practices of agriculture and industries calculated to bring about maximum efficiency in the farm and business operation; and the establishment of home industries and commercial manufacturing enterprises as an effective means of carrying out our program of industrialization.

The major activities of this Department have been so carried out as to produce results contributory to the realization of all these important objectives. Special efforts have been exerted to apprehend violators of laws, rules and regulations regarding the acquisition, exploitation, and/or conservation of public lands, forest areas, fishing grounds, and mineral resources. To facilitate and help carry out successfully the project of land settlement, steps have been taken to speed up the proper classification of our public domain and the survey and subdivision of public lands into lots for disposition to properly qualified settlers or public land applicants. To hasten the progress of industries, industrial research work has been stimulated in an effort to find the proper solution to important industrial problems that have heretofore stood in the way of progressive industrial development. Extension and educational work has been carried out more extensively than heretofore, not only to apprise the people of what the

Government is doing for their individual and collective welfare, but also to keep them duly informed and enable them to profit by the latest discoveries in science which affect their life's calling be it agricultural, mining, manufacturing, merchandising, or any branch of productive pursuit. Proper steps have been taken to interest our Government in providing Filipino farmers, businessmen, and industrialists with credit facilities with which to enable them to carry on their business or profession without going to unscrupulous money lenders and usurers for help.

THE AGRICULTURAL AND TRADE SITUATION

The system of agriculture in the country is fast undergoing important changes. Reassuring evidence of systematic agricultural planning in which the principles of crop diversification are taken into consideration is noticeable everywhere. The general tendency in the rural districts has been towards the production of the staples needed for home consumption and of certain products for export which do not depend upon the American market. There has been an unprecedented interest in the planting of fruit trees of economic value, in the cultivation of home gardens, in the raising of poultry and swine and other livestock which constitute additional sources of farm income. Likewise, the growth of home industries including cloth and hat weaving has hit a remarkably fast stride. That diversified farming is fast taking shape is indicated by the increased planting of economic crops heretofore considered of secondary importance. For instance, wide areas have been planted to coffee and cacao in the Bicol region, Mindanao, the Visayas, Mindoro, Tayabas, Batangas, and Mountain Province. Fruit trees, such as the avocado, caimito, chico, mango, lanzon, citrus, pili nut, and others and root crops and

vegetables have also been planted quite extensively in different provinces. Likewise, the cultivation of Bermuda onion, cotton, and derris has shown considerable increase. Thirty-three provinces led by Nueva Ecija and Batangas now grow Bermuda onion. During the year there were 704 hectares planted to Batangas cotton, principally in Oriental Misamis, Occidental Misamis, Cebu and Iloilo, which produced 245,000 kilos of floss with seeds, and 782 hectares planted to *kapas purao* or Ilocano cotton in Ilocos Norte, Ilocos Sur and La Union which produced 262,983 kilos of floss with seeds. The area planted to derris now covers about 2,850 hectares in 39 provinces led by Cebu, Iloilo, Bohol, Leyte, Zamboanga, and Oriental Negros.

Many factors contribute to all these significant changes, the most important of which are the limitation of our export to the United States and the low prices of products which have not shown any sign of improvement. As a result of the operation of the Limitation Act and the low prices that prevail for our important export products—sugar, tobacco, abacá, copra, and other products—farmers engaged in the production of these crops have undergone serious difficulties. The situation was made more difficult in certain places by the adverse weather conditions which characterized the year 1938 and which caused considerable destruction to cultivated crops. In the Bicol region considerable areas have been withdrawn from the cultivation of abacá and planted to other crops, primarily food crops. In some coconut regions coconut plantations have been neglected because of the sad plight of the coconut industry. Most of the difficulties of this industry have been caused by the much-discussed coconut oil excise tax, the effect of which is reduction in the price of copra and other coconut products. Despite, however, the temporary depression in the abacá and coconut industries,

some new plantings were done in newly-opened lands in Mindanao with the hope that in the years to come the situation would materially improve.

There was a time when it was feared that the 1938-1939 rice crop would be much below normal on account of the effects of floods and the serious drought, believed to be the worst yet experienced in this country during the last 20 years, which occurred in the Central Plains of Luzon, affecting the principal rice growing provinces. After undertaking a conscientious survey of the situation, however, it was found that the damage caused by the adverse weather conditions would be more than compensated by the increase in the area planted to rice, particularly in Mindanao and the Visayan provinces where a bountiful harvest was obtained. A check-up of the rice harvest for the year 1938-1939 confirmed the early finding that there need not be any fear of possible rice shortage.

Unfavorable weather conditions delayed the harvesting of tobacco in certain provinces resulting in a crop of poor quality and decrease in prices. The depression in the tobacco industry has not been confined to the local trade. There was also a serious decline in tobacco exportation which may be explained by the fact that the civil war in Spain has paralyzed the Philippine tobacco trade with that country which normally takes almost 50 per cent of our tobacco exports. The only factors that, in a way, sustained the industry during the year were the export of cigars to the United States and the growth of the local cigarette industry.

The mining industry has more than held its own. Its growth and progress have been steady and as far as prices are concerned, there is no depression in the mining business.

There was a considerable decline in the exportation of lumber and timber owing to the restriction imposed

by the Japanese Government on the importation of lumber and timber into Japan as a result of the Sino-Japanese conflict. However, a marked activity in the local market for timber and lumber was registered during the year so that despite reduced exportation, there was a slight increase in the amount of timber cut.

On the whole, general business sentiment in the Philippines during the year 1938 was fairly good although a distinct note of caution was noticeable due to the low prices realized from the principal export products to the United States and other world markets. Despite the prevailing low prices of our principal export products, there is a decided improvement in the condition of life on the farm and in business circles.

RESEARCH

One of the healthiest signs of the gradual, even if slow, material progress going on in our midst is the notable increase in the appreciation on the part of the public of the value of research work in the pursuit of activities affecting our very existence. Interest in research has ceased to be a monopoly of the scientists engaged in different phases of experimental work. To the farmer, the industrialist, and the manufacturer, the function of research has become a recognized necessity for the continuous improvement and survival of their respective trade or occupation in this highly competitive age.

Much of the claim of the Department of Agriculture and Commerce to constructive public service is rooted in its research activities embracing not only fundamental questions but also practical problems in the establishment of a stable national economy. The practical application of the results of researches already accomplished has aided materially in the progress and development of our economic resources.

There are certain classes of research that require relatively long periods of time before results of any practical value could be obtained. To these belong studies on pure science which delve into the fundamentals of basic problems, the solution of which opens the avenue for further research work in order to be of any benefit to the needs of our daily life. Researches on plant introduction and acclimatization, biological studies of the different species of plants and animals, determination of the causes of plant and animal diseases and their control, studies on botany, silviculture, entomology, and plant pathology and chemical researches on natural products, such as analysis of the physical and chemical properties of vegetable and essential oils, resins, woods, and other products, the basic data of which are of fundamental importance for purposes of industrialization, belong to this type of research. The greater bulk of our research projects, however, pertains to applied science. During the year 1938, 53 research projects were completed. At the end of the year, 161 projects are still in progress. Some of the projects completed deserve mention here.

In connection with industrialization, a process of utilizing rice hull ash for the preparation of water glass, abrasive soaps, and black figments, which have important commercial value, has been perfected. The requirements for liming and deliming hides have been determined, and by a process of chrome tanning which may be considered a significant advance in the development of the leather industry, the Government has succeeded in producing leather of very good quality. Improvements in the process of analyzing Philippine products with important commercial possibilities, such as copals, have been made. Likewise, considerable headway has been achieved in the process of manufacturing clay asbestos shingles; extraction of coloring

matter used as dyes from sawdust of certain Philippine woods; production of ethyl alcohol from cassava and sweet potatoes; degumming and bleaching of decorticated ramie fiber; and the manufacture of high-grade vinegar from sweet potatoes and cassava. The use of deodorized and refined coconut oil as a substitute for imported and costly vegetable oil for canning purposes has been quite successfully demonstrated in connection with fish canning. The refined oil is also suitable for medicinal and pharmaceutical purposes.

Along the line of agricultural improvement, results of our various experiments on the use of fertilizer have convinced many farmers of the importance of this farm practice as a means of increasing farm efficiency. Desirable strains of important crops, including palay, derris, and abacá, have been isolated; a number of plant varieties introduced into the Philippines; and improvement in native crops secured through breeding and selection. The increased use of modern farm implements and approved practices of cultivation have also been the outcome of successful research work along this line, brought home to the farming public by actual demonstration.

In the line of animal improvement, certain problems in the control of animal diseases have been finally settled. For instance, the fact has been determined that greater immunity is conferred by rabies vaccine administered in multiple injection than in one injection. The preparation of crystal violet hog cholera vaccine and a desirable tetanus toxoid has been perfected. Livestock improvement work through the use of imported pure breeds has gained considerable progress.

Problems in forest management, protection, and utilization as well as those of efficient and economical exploitation of the mining industries have also been the subject of research, the results of which are of decided utility in the further development of these industries.

INDUSTRIALIZATION

There has been no departure from the policy of giving industrial research all possible support and encouragement to hasten its progress and produce results which may be of practical utility to the economic development program of the Commonwealth. To the list of industrial projects turned over to the National Development Company in 1937 for commercial exploitation, no new project has been added, but the Industrial Committee of the Department has been fully occupied with the study of a long list of industrial possibilities on which experiments are in progress. The trip to the United States and Europe undertaken by the former Secretary of Agriculture and Commerce, Hon. Eulogio Rodriguez, which lasted nearly five months, had for its object the acquisition of first-hand information on the modern methods and technique of industrial development employed in those highly advanced countries from which the Philippines might profit. It was in the course of this trip that the services of Dr. Raymond Bacon, a former director of the Mellon Institute, were availed of by the Philippine Government in its effort to adjust its research activities to the needs of the country for economic and industrial development.

LOCUST SITUATION

At the beginning of the year under review, 26 municipalities were infested with locusts covering an area of 278 hectares. About the end of the year, only 9 municipalities in 5 provinces remained infested and the area covered by the infestation was only 90 hectares. The marked improvement of the situation is attributable to the untiring efforts of municipal and provincial officials who are directly charged with the duty of eradicating this pest and the coöperation willingly ex-

tended by the fieldmen of this Department who were instructed to extend assistance to the officials concerned to hasten the complete eradication of this great scourge of agriculture.

About the month of August, the Director of Plant Industry began releasing funds to locust-infested provinces as aid of the Insular Government in the eradication of this pest. The provinces of Agusan, Bukidnon, Albay, Camarines Sur, Cotabato, Davao, Tayabas, Mindoro, Leyte, Laguna, Sorsogon, and Surigao, were benefited by the P10,000 first released by the Bureau with the approval of the Department Secretary. The amount given to each province depended on the extent of infestation by locusts or other plant pests or on the seriousness of the infection by plant diseases.

SOIL SURVEY

The soil survey project, which was started in 1934 under a Soil Survey Committee created that year and now composed of the Under Secretary of Agriculture and Commerce as Chairman and the Directors of the Bureaus of Science, Plant Industry, Forestry, Lands, Mines, and Weather Bureau as members, with Dr. M. M. Alicante, Soil Technologist of the Bureau of Science, in charge of carrying out the work, was extended from Luzon to the Visayan provinces during the year under review. Without any fixed appropriation for the soil survey project, it has been possible to carry on the work only through the joint efforts of these different bureaus each of which has been required to contribute certain number of personnel to constitute the present soil survey staff. Under the direction of the Soil Survey Committee, a complete survey of Philippine soils is being done as fast as facilities permit. The necessary field work is facilitated by the employment of fieldmen of the Bureaus of Plant Industry and Forestry; the data on climate gathered by the Weather

Bureau; and the soil-survey maps prepared by the Bureaus of Lands and Mines.

It is gratifying to note that both the National Economic Council and the Joint Preparatory Committee on Philippine Affairs, fully recognizing the need and the value of this work in relation to the development of the country's economic resources, have recommended a thorough and nation-wide agronomical (soil) survey of the Philippines.

Although up to date already 21 provinces have been completely soil-surveyed, seven of them in 1938, so far only the reports on four provinces have been published. These are the reports for Rizal, Bulacan, Cavite, and Batangas, the report for Batangas having been released in 1938, the reports for the first three during the years previous. At the close of the year, the report for the province of Pampanga was in the process of publication and those for the provinces of Tarlac, Nueva Ecija, and Laguna in their final stages of preparation. The field and laboratory work for the provinces of La Union, Ilocos Sur, and Abra have been completed; the laboratory analysis of the soil samples from the provinces of Bataan, Zambales, and Nueva Vizcaya is in progress and the field work in the provinces of Iloilo, Occidental Negros, Oriental Negros, Cebu, and Tayabas practically completed.

For the purpose of correlating the data obtained from the field survey and laboratory analyses of the different soils found in each province with the actual requirements of farm lands to improve crop yield, fertilizer experiments with the staple crops of each province surveyed are being undertaken. The field experiments now in progress include the use of fertilizer for both upland and lowland rice, coconut, citrus, lanzones, and other fruit trees. The results obtained in rice experiments during the year 1938 were very encouraging.

From the soil survey report published in its final and complete form may be gleaned the inestimable value of this work to proper agricultural planning for maximum efficiency in farm operations. The soil survey report contains, among other things, a general description of the province surveyed, its location, topographic features, irrigation and drainage, transportation and market facilities, and the character of its population. It gives a brief history of the agriculture of the area, the treatment to which the soils had been subjected in the past, the present system of cultivation used, and the principal crops grown. The general characteristics of the soils of the region are described and the classification of the soils into groups on the basis of their characteristics explained. The various soils are compared indicating the differences between them and explaining the soil-forming processes which have brought about such differences. Each type of soil is described as to its profile, minor variations, topography, condition of drainage, crops, fertilizer and land values, and future possibilities. The map which supplements the soil survey report shows the area occupied by each soil type and its distribution in the area covered by the report. This map also indicates the natural features including the streams and bodies of water, marshes, and prominent elevations, and the artificial features, such as roads, railroads, towns, ditches, and other important constructions. From all these valuable data, an efficient and economical system of farm management can be planned and carried out for bigger farm profits. The equally important problems of conserving the productivity of the soil through systematic crop adjustments, the use of proper fertilizers, the control of floods, and the prevention of soil erosion can also be approached scientifically and effectively. Such basic data on soils are needed particularly in the

regions of the Philippines, like Mindanao and Sulu, where the project will be extended in 1939, which are just being opened for settlement and exploitation.

DEVELOPMENT OF MINDANAO AND SULU

In the realization that the development of Mindanao and Sulu, which has for years remained not only a problem but a challenge to the resourcefulness and constructive genius of the Filipino people, is indispensable in the establishment of a lasting and stable political, social, and economic foundation of an independent Philippines, the Philippine Government has buckled down with increased determination to carry out a systematic, speedy, and effective exploitation of the fertile resources of Mindanao and Sulu. The work of developing this region involves every phase of activity in nation building. In its present state, it may be said to cover two important phases, the first and the most important being the legal disposition of its vast forest resources and public lands and the encouragement of settlers and homeseekers to establish permanent abode therein; and the second, the intensification and expansion of governmental activities already being undertaken in the inhabited places and linking these activities with those of the newly-settled areas.

In the early part of the year the Department of Agriculture and Commerce made a comprehensive outline of its various activities in connection with the general development work of Mindanao and Sulu. The forces of the Department already at work in Mindanao have been bolstered up and given instructions not only to coördinate their different activities but also to work in close coöperation with the other forces of the Government identified with the Mindanao project. The contribution that this Department has made to the progress of this gigantic government undertaking dur-

ing the year 1938 is hard to estimate. Suffice it to say that the Department has, among other things, intensified its activities on the classification of public lands to delineate alienable and disposable portions thereof from the areas needed for forest purposes, the survey and subdivision of alienable and disposable public lands into small lots for settlers and homeseekers, and the disposition of subdivided lots to qualified applicants. Portions of public lands along national highways or proposed roads have been subdivided first to attract settlers. With the ₱2,500,000 appropriated under Commonwealth Act No. 347 for classification, survey, and subdivision of public lands, the progress of this work has been accelerated. The classification of lands opened for settlement with respect to crop adaptability has also been undertaken to facilitate the proper allocation of homeseekers according to the nature of their farm experience. For instance, settlers coming from the rice-growing provinces are sent to regions in Mindanao adapted to rice culture; those coming from the tobacco or coconut provinces, to regions adapted to the culture of tobacco or coconut, etc. The work of setting aside tracts of land for non-Christians has also been started.

Similarly, efforts have been exerted to hasten the progress of the work on reconnoissance or forest surveys on proposed timberlands, survey of grazing lands, and the exploitation of coal, iron, and other mineral deposits. The survey of other natural resources found in that region including fisheries and inland fishponds has also been started to determine their possibilities for systematic development.

In the populated regions, there has been general intensification of activities in agricultural and livestock promotion as well as in the establishment of coöperative marketing associations and other coöperative

efforts to facilitate the marketing of local agricultural and industrial products and the purchase of commodities needed by the inhabitants of the community. Through properly conducted extension work which includes the dissemination of improved agricultural practices, the control of plant pests and diseases, and the propagation and distribution of improved seeds and plant materials produced in the local experiment stations and seed farms, much progress has been attained in the promotion of agricultural industries. Likewise, the promotion of livestock has been accelerated through proper control of animal diseases and systematic campaigns to encourage the production of improved types of animals, including horses and cattle, and the raising of swine and poultry on a more extensive scale. All these activities are automatically extended to newly-settled regions to give the settlers all possible aid and encouragement in the planning and carrying out of their farm activities and in the establishment of model settlement communities.

The Department of Agriculture and Commerce has taken every available opportunity to make recommendations to the proper branch of the Government for the proper carrying out of the government's mission in Mindanao and Sulu whenever it felt such recommendations in order for the good of the service. It placed before the National Economic Council squarely a plan of developing Mindanao through a systematic method of colonization believed to be most practicable and effective under the conditions obtaining therein. The original recommendation for the digging of artesian wells in places intended for settlement, which was accorded favorable action by the Department of Public Works and Communications, emanated from the Department of Agriculture and Commerce. Among many other things, the Department has also recommended

the establishment of health units and educational centers for the benefit of the settlers establishing themselves in Mindanao.

For the purpose of making the varied activities of this Department in Mindanao more effective and in harmony with those performed by other branches of the Government and facilitating the present development work in that part of the country, special efforts have been exerted to consolidate and coördinate these varied activities under a specially-designated coördinating officer whose duties include that of a liaison officer between the Department of Agriculture and Commerce and the Commissioner for Mindanao and Sulu with whom all the personnel of the Department have been instructed to coöperate in matters affecting the development of the agricultural, commercial, industrial, and natural resources of that region. As a further measure of securing every possible coöperation and co-ordination of activities in that region and of facilitating action on all matters pertaining to colonization with which the Department of Agriculture and Commerce has something to do, the Commissioner for Mindanao and Sulu was designated as Delegate of the Secretary of Agriculture and Commerce in all matters pertaining to agricultural colonies in Mindanao and Sulu.

THE JOLO LAND PROBLEM

To better understand this problem, it would be necessary to recall to mind the actual conditions and circumstances existing at the time the lands in Jolo were surveyed and cadastral proceedings heard in connection with the issuance of titles thereto. It has been observed that cadastral surveys were undertaken during the period of attraction when the Moros were cajoled and even pampered so that they would willingly embrace the new form of government to which they then looked with distrust and suspicion. At that time

the Moros refused to have their lands surveyed unless assured that the Government would not collect anything from them in the form of cadastral costs so that apparently the members of survey parties had to give them this assurance to enable them to gain access to the land of the Moros and undertake the necessary survey. It is not, therefore, surprising that the Moros now refuse to pay cadastral costs incurred in the survey of their lands. These cadastral proceedings took place during the hectic days of the American administration in Mindanao and Sulu when internal disorders were prevalent so that legitimate property owners had to flee to the mountains for safety, thus enabling unscrupulous individuals to register lands, not their own, in their names. The foregoing constitute two of the root causes of the present Jolo land problem. The various angles of this problem may be graphically illustrated and summarized as follows:

1. Controversy over registered lots title to which had been issued way back in 1920, 1923, and 1926:

- a. Conflicts between headmen, hadjis, panglimas or elders, or their heirs in whose names big tracts of land were registered on the one hand and their "sakops" on the other. In the course of cadastral proceedings the "sakops," through affidavits duly signed and authenticated by them, have allowed their lands to be registered in the names of their headmen;
- b. Controversy between registered owners who, through fraud, deceit, or otherwise, were able to have big tracts of land surveyed and registered in their names, and bona fide claimants and occupants who allege to be the lawful owners thereof;
- c. Boundary disputes.

2. Controversy over lots comprised within the special land grants given to the Sultan of Sulu or his direct heirs. Apparently, those special land grants have been and are actually occupied and cultivated by adverse claimants who have already introduced considerable improvements thereon.

the establishment of health units and educational centers for the benefit of the settlers establishing themselves in Mindanao.

For the purpose of making the varied activities of this Department in Mindanao more effective and in harmony with those performed by other branches of the Government and facilitating the present development work in that part of the country, special efforts have been exerted to consolidate and coördinate these varied activities under a specially-designated coördinating officer whose duties include that of a liaison officer between the Department of Agriculture and Commerce and the Commissioner for Mindanao and Sulu with whom all the personnel of the Department have been instructed to coöperate in matters affecting the development of the agricultural, commercial, industrial, and natural resources of that region. As a further measure of securing every possible coöperation and co-ordination of activities in that region and of facilitating action on all matters pertaining to colonization with which the Department of Agriculture and Commerce has something to do, the Commissioner for Mindanao and Sulu was designated as Delegate of the Secretary of Agriculture and Commerce in all matters pertaining to agricultural colonies in Mindanao and Sulu.

THE JOLO LAND PROBLEM

To better understand this problem, it would be necessary to recall to mind the actual conditions and circumstances existing at the time the lands in Jolo were surveyed and cadastral proceedings heard in connection with the issuance of titles thereto. It has been observed that cadastral surveys were undertaken during the period of attraction when the Moros were cajoled and even pampered so that they would willingly embrace the new form of government to which they then looked with distrust and suspicion. At that time

the Moros refused to have their lands surveyed unless assured that the Government would not collect anything from them in the form of cadastral costs so that apparently the members of survey parties had to give them this assurance to enable them to gain access to the land of the Moros and undertake the necessary survey. It is not, therefore, surprising that the Moros now refuse to pay cadastral costs incurred in the survey of their lands. These cadastral proceedings took place during the hectic days of the American administration in Mindanao and Sulu when internal disorders were prevalent so that legitimate property owners had to flee to the mountains for safety, thus enabling unscrupulous individuals to register lands, not their own, in their names. The foregoing constitute two of the root causes of the present Jolo land problem. The various angles of this problem may be graphically illustrated and summarized as follows:

1. Controversy over registered lots title to which had been issued way back in 1920, 1923, and 1926:

- a. Conflicts between headmen, hadjis, panglimas or elders, or their heirs in whose names big tracts of land were registered on the one hand and their "sakops" on the other. In the course of cadastral proceedings the "sakops," through affidavits duly signed and authenticated by them, have allowed their lands to be registered in the names of their headmen;
- b. Controversy between registered owners who, through fraud, deceit, or otherwise, were able to have big tracts of land surveyed and registered in their names, and bona fide claimants and occupants who allege to be the lawful owners thereof;
- c. Boundary disputes.

2. Controversy over lots comprised within the special land grants given to the Sultan of Sulu or his direct heirs. Apparently, those special land grants have been and are actually occupied and cultivated by adverse claimants who have already introduced considerable improvements thereon.

3. Controversy over lots declared by competent courts as part and parcel of the public domain. These lots which have been declared public lands are also occupied and cultivated by claimants, some of whom have already filed free patent applications covering the portions actually occupied by them. For some reason or other, these free patent applications are still pending approval by the Director of Lands.

4. Controversy over parcels of land not yet adjudicated to any claimant and which are still pending hearing before cadastral courts.

In the order in which the foregoing problems are enumerated, this Office has either taken measures to help solve this mooted land problem or submitted for His Excellency's consideration, under an indorsement of November 6, 1938, the following recommendations:

1. (a) and (b) Enactment of appropriate legislation with the end in view of reviewing and reopening those cases of registered lands, titles to which had been issued way back in 1920. As indicated in said indorsement of this Office, it is believed that this step is the only possible remedy to meet the situation;

(c) In accordance with the desire of His Excellency, and pursuant to written instructions of this Office, the Director of Lands on November 23, 1938 directed the district land officer at Zamboanga to detail an assistant public lands inspector in Jolo with the necessary survey personnel to help settle boundary disputes and expedite the amicable settlement of controversies that could be adjusted extrajudicially;

2. As to special land grants given to the Sultan of Sulu or his direct heirs, recommendation was made to the effect that the lands granted to Moro dignitaries which are occupied and cultivated by legitimate owners other than the grantees, be substituted by other land grants in Tawi-Tawi island or in any of the adjacent islands fit for the purpose. As this matter likewise calls for appropriate legislation, representation to that effect was accordingly made to His Excellency.

3. In connection with the controversy over lots declared by competent courts as part and parcel of the public domain, the Director of Lands, acting under instructions from this Office, ordered the assignment of one public lands inspector in the Office of the Provincial Governor of Sulu, to give free patent and

other public land applicants the necessary advice, and help them expedite the preparation and filing of their respective applications.

4. In connection with the controversy over parcels of land not yet adjudicated to any claimant and which are still pending hearing before the cadastral court, it has been recommended that a campaign of information be conducted to enlighten the Moros on the advisability of appearing in the cadastral court to prevent the forfeiture through default of their property in favor of the Government or the registration of the same in the names of other persons. As an initial step, this Office addressed a letter, through the Office of the President, to the Secretary of the Interior on November 16, 1938, suggesting the issuance of a circular to secure the coöperation of provincial and municipal officials who, in the performance of their duties, are daily in close contact with the people, to impress upon the minds of the Moros and other legitimate property owners the necessity and importance of appearing in cadastral hearings and asserting their rights over lands they claim their own and thereby minimize mistakes in the adjudication of land titles.

While the final solution of the Jolo land problem may yet be a long way off, it is hoped that the initial measures taken by this Department will help relieve the present tense situation in Jolo.

TEMPORARY PERMITS TO MINE AND EXTRACT ORE

Under the provisions of section 62 of Commonwealth Act No. 137, the Mining Act, a mining locator acquires the right of exploration and occupation from the date of the registration of the claim in the office of the mining recorder, but he is not entitled to mine or extract minerals from the claim for commercial purposes until a lease is granted thereon as provided in the said Act. In order to expedite and facilitate the operation of mines, the National Assembly enacted Commonwealth Act No. 309 on June 9, 1938, extending to an applicant of a mining lease opportunity to start mining operation during the pendency of his lease application. This Act provides, among other things, that an applicant for lease of a mining claim whose application appears to be



prima facie well-founded is entitled, before the lease is granted, to a temporary permit to be issued by the Secretary of Agriculture and Commerce, to mine and extract minerals from said claim for commercial purposes, subject to the payment of royalties provided in the Mining Act. It amends section 62 of Commonwealth Act No. 137.

Difficulty arises in case of a lease application which is the subject of an adverse claim. This is brought about by the fact that section 73 of the Mining Act provides, among other things, that upon the filing of any adverse claim, all proceedings, except the publication of the notice of application for lease, shall be stayed until the controversy shall have been settled or decided by a court of competent jurisdiction or the adverse claim waived. Commonwealth Act No. 309 does not amend section 73 of the Mining Act. As stated above, it only amends section 62 thereof. If under such circumstances all the proceedings were stayed, the question that comes up is: Is it advisable to issue a temporary permit to extract minerals under Commonwealth Act No. 309 if an adverse claim is already filed in the Bureau of Mines? To give effect to the spirit of Commonwealth Act No. 309, this Office decided to issue a temporary permit to extract minerals although there is an adverse claim filed in the Bureau of Mines, provided that the application has been found to be *prima facie* well-founded. The right of the adverse claimants, as well as that of the Government, is, however, safeguarded by the requirement that the granting of the permit is conditioned upon the filing of a sufficient bond to guarantee, among other things, the fulfillment of the terms of the permit and the payment of damages that may be caused to the adverse claimants or to the Government. Temporary permits

issued pursuant thereto are made to cover a period of six months only. Where, however, an adverse claimant institutes an action in court, a permit is not issued on the ground of lack of jurisdiction on the part of this Department because the matter is *sub-judice*.

PROTECTION AND CONSERVATION OF GAME AND BIRDS

This Office secured the coöperation of the heads of other departments of the Government and the Chief of Staff of the Philippine Army whereby those of their fieldmen fitted to help enforce the laws, rules and regulations for the protection and conservation of game and birds may be designated as deputy game wardens. The Department heads concerned have consented to the appointment of the public defenders and labor agents of the Bureau of Labor, the district engineers and assistant civil engineers of the Bureau of Public Works, and the supervising linemen of the Bureau of Posts as deputy game wardens. Accordingly, all these officials and employees have been designated by this Office as such. All game wardens and officials or employees required by law to enforce the rules and regulations for the protection and conservation of animal life have been enjoined to exert their utmost to make the campaign effective. To further insure the success of this campaign, Fish and Game Administrative Order No. 8, dated April 5, 1935, declaring certain designated areas closed to hunting, was renewed on July 15, 1938, the date on which the said order was to have expired. This campaign has for its purpose the proper education of the people on the importance of conserving and propagating wild animal life and preventing their extermination so that they may again be found in abundance in their natural habitat.

CAMPAIGN AGAINST DUMMIES

Decisive steps have been taken to curtail the undesirable practice of certain officials and employees of acquiring interests directly or indirectly in the exploitation of natural resources as dummies of foreign capitalists by taking advantage of their position in the Government. Rules and regulations regarding the acquisition of public lands, forest concessions, leases, license agreements, fishpond permits, commercial fishing boat licenses, mining and oil concessions in Mindanao and Sulu by officers and enlisted men of the Philippine Army, national or provincial officials, and other employees in that region have been prescribed under Administrative Order No. 59 issued by His Excellency, the President of the Philippines, on January 14, 1938.

Several complaints against forest concessionaires including prominent businessmen of Manila, who were charged with operating forest concessions in Agusan and other places as dummies of foreign capitalists, have been looked into to determine their truth or falsity. The investigation is still in progress.

In the latter part of the year, investigation of the fishing activities of aliens in this country was started to verify the truth of reports received in this Office that many Filipinos are being used as dummies by Japanese capitalists who control the fishing industry in the rich fishing grounds of Palawan and elsewhere. Preliminary results seem to indicate that there is some truth in these reports.

THE CASE OF THE SAN JOSE ESTATE

The case of the San Jose Estate has already been decided in favor of the Government by the Court of First Instance of Manila in civil case No. 44937, entitled "Commonwealth of the Philippines, plaintiff

versus Mindoro Sugar Estate Co., *et al.*, defendants." The amount of ₱625,732 paid by the Mindoro Sugar Estate has been forfeited in favor of the Government together with 17,260.811 hectares forming the greater portion of the Estate, leaving to the Mindoro Sugar Estate 1,024 hectares, the maximum allowed by law to a corporation. A plan is under way to subdivide these 17,260.811 hectares into 10- and 20-hectare lots each for resale at cost to qualified public land applicants. A portion of it may be subdivided into 50- to 200-hectare lots for those who can afford to cultivate larger tracts.

APPEALED CASES DISPOSED OF

Under the provisions of section 4 of Commonwealth Act No. 141, the Director of Lands is charged with the duty of disposing of public lands alienable under the provisions of the Public Land Law. This duty carries with it the authority to decide claims to public lands, conflicts in public land applications, controversies between occupants and public land applicants, questions affecting preferential right of contending parties, violation of the provisions of the Public Land Law and of the Constitution of the Philippines affecting disposition of public lands, qualifications of public land applicants, and other matters related to the administration of lands of the public domain. The decisions of the Director of Lands are appealable to the Secretary of Agriculture and Commerce within the time prescribed by the provisions of Lands Administrative Order No. 6 promulgated pursuant to the provisions of section 79-B, Act No. 2711, section 5, Act No. 2874, now section 5 of Commonwealth Act No. 141, and Act No. 3038. The Secretary of Agriculture and Commerce also exercises appellate jurisdiction over cases decided by the Bureaus of Forestry, Commerce, Science, and Mines.

During the year 1938, the Secretary of Agriculture and Commerce rendered 240 decisions and orders in cases appealed from the Bureau of Lands. One hundred and sixty-five of said decisions and orders affirmed, and 75 reversed or modified, the decisions and orders of the Director of said bureau. This Office entered 326 interlocutory orders requiring parties to file their respective memoranda and the Director of Lands to forward records within certain period. Among other things, the orders were either giving interested parties sufficient time to file their briefs, or extending the time for the presentation of the memoranda or briefs by the contending parties or their respective attorneys. Parties who had lost their cases in which decisions and orders rendered by the Bureau of Lands or by this Office had long become final sometimes filed petitions for relief under the provisions of section 14 of Lands Administrative Order No. 6. Twelve of said petitions were disposed of by this Department during the year 1938.

In the cases appealed from the Bureau of Forestry, 24 decisions were rendered by this Office in 1938, 19 of which affirmed and 5 reversed the decisions of the Director of the said bureau. Those decisions involved conflicts between different forest licenses, claims to forest lands, controversies between private claimants on the one hand and forest licensees or permittees on the other, and other questions affecting preferential rights of contending parties.

In the appealed cases from the Bureau of Commerce which involved registration of trade-marks and trade names and election of officers of rural credit associations, nine decisions were rendered by this Office during the year 1938, 7 of which affirmed and 2 reversed the decisions and orders of said bureau.

From the Bureau of Science, three cases were appealed to this Office affecting questions of preferential rights regarding fishponds and fisheries. This Office rendered two decisions affirming, and another decision reversing, the orders of the Bureau of Science.

During the year 1938, five cases were appealed to this Office from the Bureau of Mines. All those cases affect questions involving disposition of mineral resources. This Office disposed of three of said cases by dismissing the appeal of the appellants.

There were likewise issued 106 orders disposing of motions for reconsideration of the decisions and orders rendered by the Secretary. Some of those motions raised not only questions of facts and evidence but also points relating to the interpretation of law and regulations issued thereunder.

During the said year 1938, this Office issued 19 formal orders of reinvestigation. This was done due to the fact that upon a careful review of the proceedings of investigation conducted by representatives of the Bureau of Lands, this Office either found that there were certain material points overlooked in the course of the investigation or that the investigation was superficial or that the inspectors conducting the investigation were charged with partiality or bribery. For these reasons, reinvestigations were ordered by this Office.

Some of the parties who lost their cases in this Office went to the courts of justice, but all our decisions were upheld either by the Court of First Instance or by the Court of Appeals.

LEGISLATION

Among the bills submitted by the Department to the Office of the President of the Philippines for consideration during the last session of the First National

Assembly, the following were enacted into law as indicated:

Bill No.	Subject	Date of approval	Commonwealth Act No.
1287	An Act penalizing the sale of imported eggs of which the shells are not plainly marked "Imported" as provided in Act No. 4037 and for other purposes.....	June 3, 1938	274
3478	An Act creating an Animal Utilization Service in the Bureau of Animal Industry and appropriating funds for its establishment, equipment, maintenance and operation, and for other purposes.....	June 21, 1938	340
3617	An Act to provide for the reforestation and afforestation of watersheds, denuded areas and cogon or open lands within forest reserves, communal forests, national parks, and timberlands, sand dunes, and other public forest lands in the Philippines.....	June 9, 1938	304
3755	An Act punishing the transfer of private agricultural land to disqualified persons in violation of the Constitution of the Philippines	June 9, 1938	310
3839	An Act to amend section 2 of Commonwealth Act No. 32 entitled "An Act providing for the subdivision and sale of all the portions of the friar lands estates remaining undisposed of"	June 9, 1938	316
3878	An Act appropriating ₱2,500,000 for the classification, survey and subdivision of public agricultural lands	August 19, 1938	347

It will be observed that the foregoing acts deal with the economic development and conservation of our natural resources.

Other bills pertaining to this Department submitted by the Office of the President to the National Assembly are still pending consideration by the committees concerned.

ORGANIZATION AND CHANGES IN PERSONNEL

As presently organized, the Department of Agriculture and Commerce is composed of the following bureaus and offices:

- Office of the Secretary
- Division of Statistics
- Division of Publications
- Bureau of Plant Industry
- Bureau of Animal Industry
- Bureau of Forestry
- Bureau of Lands
- Bureau of Science
- Bureau of Commerce
- Bureau of Mines
- Weather Bureau
- Fiber Inspection Service
- Veterinary Examining Board
- Board of Examiners for Surveyors

The undersigned assumed office as Secretary of Agriculture and Commerce vice the Hon. Eulogio Rodriguez on November 26, 1938.

Secretary Rodriguez left the Philippines on March 22, 1938 for a tour of America and Europe and returned on August 8, 1938. While he was away Under Secretary Jose S. Camus took charge of the Department until June 22, 1938, when Secretary Mariano Jesus Cuenco of Public Works and Communications was designated Acting Secretary of Agriculture and Commerce.

The Director of the Bureau of Science, Mr. Angel S. Argüelles, went abroad to attend the First International Congress on Chemical Fertilizers held in Rome, Italy, and visit different scientific institutions in Europe and the United States. Dr. Eduardo Quisumbing was designated Acting Director of the Bureau of

Science during the absence of Director Argüelles which lasted from August 29, 1938 until January 5, 1939.

During the absence of Director Quirico A. Abadilla on official business abroad from July 15 to August 31, 1938, Mr. Demetrio Andres was designated Acting Director of the Bureau of Mines.

Mr. Vicente C. Ramos was appointed Technical Adviser in the Office of the Secretary of Agriculture and Commerce on October 1, 1938.

Mr. Eduardo R. Alvarado was appointed Chief of the Division of Publications of this Department on November 16, 1938.

Mr. Ruperto T. Martinez was appointed Chief Attorney in the Office of the Secretary of Agriculture and Commerce on January 1, 1938.

Mr. Cornelio V. Crucillo was appointed Technical Assistant in the Office of the Secretary of Agriculture and Commerce on March 3, 1938.

There have been other changes in personnel in the lower positions which are not enumerated herein.

Several important committees were created during the year of which may be mentioned the committee to reappraise the lands and improvements at the Port Area, Manila, covered by the subsisting leases under the provisions of Act No. 1654, as amended, and of Chapter IX of Commonwealth Act No. 141; the committee to fix accurate appraisal of the actual price of homesites in the Hacienda Concepcion in Malabon, Hacienda Baclaran in Parañaque, and the Mariquina Estate in Mariquina, Rizal; the Advisory Committee for Tongonan Hot Spring National Park; the committee to study the problems of the abacá industry and its market and recommend measures for their improvement; and the committee to appraise forest lands and improvements thereon applied for for pasture and sawmill sites purposes and under lease agreements.

ACTIVITIES OF BUREAUS, SPECIAL DIVISIONS, AND BOARDS
UNDER THE DEPARTMENT

BUREAU OF PLANT INDUSTRY

GENERAL CLIMATIC CONDITIONS AFFECTING CROPS

As in the year 1937, the weather conditions prevalent during the year under review were unfavorable to agriculture. The last drought which is conceded to be the worst in twenty years occurred not only in Luzon but also in the Visayas and in several Mindanao provinces up to the middle part of August, causing considerable damage to crops, especially the upland and non-irrigated lowland rice in the Central, Northern, and Southern Luzon provinces and in Marinduque. During the latter part of the year, destructive typhoons passed through the Visayas, Northeastern Luzon, and Northern Mindanao provinces which are ordinarily out of the typhoon belt. The Cagayan Valley, Northern Tayabas, the Bicol provinces, and the Visayas, particularly Leyte, Samar, Cebu, Romblon, Masbate, and Mindoro, equally suffered from severe typhoons and floods. The combined effects of these abnormal weather conditions caused heavy losses in agricultural crops, valued millions of pesos.

PLANT SANITATION ACTIVITIES

Intensive locust scouting work was undertaken during the year throughout the Islands, particularly in the unexplored areas of Cotabato, Davao, Masbate, Bukidnon, Lanao, Oriental Misamis, Oriental and Occidental Negros. The number of persons employed in the locust campaign this year was almost twice that employed the previous year. A total of 14 provinces covering approximately 3,056 barrios was placed under rigid scouting work. The total area scouted aggregated 10,077,860 hectares. Of the 21 provinces infested, 14 were freed or controlled, leaving only 7 provinces slightly infested. There were destroyed 726 cavans of eggs, 74,754 cavans of hoppers, and 40,376 cavans of flyers. Approximately 1,355.9 hectares of ricefields, 1,304.9 of corn, 5,538.4 of sugar cane, 88,128 of coconut trees, and 184 of miscellaneous crops were damaged.

Sporadic outbreaks of other plant pests and diseases, such as the rice cutworms, caseworms, leaf hoppers, rice stem borers, leaf folders, coconut leaf miners, black beetles, slug caterpillars, coconut leaf moth, coconut budrot, cadang-cadang, leaf spot, root weevils, bunchy top, vascular and mosaic diseases of abacá, rats, and other pests and diseases of tobacco, sugar cane, fruit trees, and vegetables were also attended to during the year.

A total of 1,157,993 inspected parcels of plants and plant materials entering the country showed 40 cases of interceptions of insects on plants and plant materials and 143 of plant diseases. A total of 117,648 parcels were inspected and exported to 48 different countries. As usual internal quarantine work was done all over the Islands, especially in the control of abacá diseases in Davao and Cotabato.

PLANT INVESTIGATION ACTIVITIES

1. *Agronomy*.—Various investigations were undertaken on rice, peanuts, sugar cane, cassava, and other root crops. The most outstanding results obtained are the following: possibility of growing palay habitually cultivated in the Mountain Province at low altitudes and vice versa; isolation of desirable strains of palay; determination of nitrogenous and phosphatic fertilizer requirements of rice soil; successful introduction of rice from China and adaptability of standard rice varieties to Mindanao and other regions; resistance to drought of some corn varieties, like La Union No. 2, Davao No. 1, and Lanao No. 1; Calamba Yellow and Guam White for wet season planting and American Mestizo and Ilagan White for dry season planting; Biit variety of peanut for sandy soils; complete fertilizer requirement for cassava containing 40 kilos each of available nitrogen, phosphoric acid, and potash per hectare; close spacing of arrowroot at a distance of 0.75×0.50 meter; and fertilizing tugui with 250 kilograms of nitrophoska per hectare. Chinese water chestnut, *Eleocharis tuberosa* Schultes, was successfully cultured for the first time in the Islands at the Central Experiment Station.

2. *Horticulture*.—Investigations were likewise undertaken on fruits and nuts, such as mango, avocado, lanzones, citrus, pili, coffee, and cacao; vegetables and beans, like asparagus, cauliflower, soybeans, chick-peas, onions, cabbage, tomato, cowpea, mongo, eggplant, etc.; coconut and other oil plants, and derris and other medicinal plants.

A few of the outstanding accomplishments in this direction are the following: bud differentiation on mango twigs before and after smudging; avocado seedlings grown from halved seeds were found to produce generally taller and larger trunks than those grown from whole seeds; a varietal description of avocados grown in the Philippines was recorded; pili nuts grown in the Bicol region were surveyed and thin-shelled-nut districts were located; some high-rotenone-producing derris strains like those grown in Tacub, Iligan (Lanao), Pavia (Iloilo) and Masbate

Province were discovered; Mis 28 E. B. Str. 3910, Mis 33 Dixi, Head Green and American Black, varieties of soybeans were found to be promising for dry season culture; and the varieties of cabbage, Bukhuizen Glory, Charleston Wakefield, Autumn King, and Early Stonehead were found to be good yielders.

3. *Tobacco research.*—An intensive campaign for the production of wrapper leaf tobacco, cigar filler leaf tobacco, aromatic cigarette leaf tobacco, and batek leaf tobacco in the tobacco regions of the Islands, especially in the Cagayan Valley, Tubao Valley, Batangas, Ilocos region, including Pangasinan and Nueva Ecija, and other tobacco regions of the Visayas and Mindanao was conducted during the year. There were distributed 169,649 grams of tobacco seeds of which 144,639 grams were of the cigar filler type; 6,365 of wrapper type (Sumatra); and 18,645 of aromatic cigarette type.

4. *Fiber research.*—Researches were undertaken on abacá, cotton, suiting cloth, ramie cloth, breeding of fiber plants, and construction of mechanical devices, all with gratifying results. About 80,800 meters of abacá burlap valued at ₱3,848 were received from the Bicol provinces. The products manufactured and sold consisted of abacá linen, cotton cloth for suiting, bed covers, jusi, towels, etc., valued at ₱739.93 and abacá burlap valued at ₱4,873.79.

An abacá experiment station was established on January 3, 1938 in Barrio Banao, Guinobatan, Albay. This is now known as the Guinobatan Abacá Experiment Station. The station site covers three parcels of land with a total area of 840,663 square meters valued at ₱14,419.89. Fifteen hectares are now planted extensively to citrus, nursery and miscellaneous plants for propagation purposes, and miscellaneous fruit trees.

5. *Plant utilization.*—As a result of researches undertaken during the year, about 447 different recipes were formulated for different products, like talinum, cassava, banana, pinipig, peanuts, mushroom, corn, coconut, papaya, etc.; a good grade of dextrine was prepared from cassava starch; and syrup similar to "caro" was made using sugar cane juice and glucose. About 1,190 analyses of different plants and plant products were performed, and 900 liters of kasoy wine, 452 of pineapple, 513 of duhat, 300 of katuri, 210 of lipoti, 81 of balimbing, and 35 of roselle, prepared.

Rural improvement clubs among women in the provinces were organized with a view to improving living conditions in the rural districts. Student home demonstrators from different

provinces were taught meal planning, table service, healthsome management and improvement, principles of cooking, financing and budgeting, food preservation, food preparation, canning, and home industries work.

6. *Agricultural engineering*.—Improvements on the designs of the Malayan copra dryer types 7 and 15, cassava mill, and the derris insecticide factory were made. An earth fill dam was constructed at the Baguio Plant Industry Experiment Station and a hydraulic ram, pipings, and reservoirs installed in Novaliches, Calocan, Rizal. A huller-crusher for kasoy was designed and constructed.

The insecticide factory produced a total of 796.8 kilos of derris products as follows: fine powder, 451.7 kilos; coarse powder, 165.2 kilos; and fiber, 179.9 kilos. The oil mill turned out 280 liters of coconut oil; 120 liters of castor oil; and 15 liters of African palm oil. The cotton gin produced 9,362 kilos of floss and 17,268 kilos of seeds out of 116 bales of cotton bolls.

7. *Entomology*.—Detailed studies looking towards the extermination of the most serious pests of major agricultural crops were made. This included the Oriental migratory locust, *Locusta migratoria manilensis* Meyen; the rice insects, such as rice stem borers, *Schoenobius incertellus*, *Scirpophaga innotata* and *Chilo* sp.; the leaf hoppers, *Nephotettix apicalis*, *N. bipunctatus*, and a fulgorid, *Liburnia sordescens*; corn borer, *Pyrausta nubilalis*; and cotton, fruit trees and vegetable insects and termites.

8. *Plant pathology*.—Active investigations of the urgent problems of plant diseases were carried out especially those on cereals, fruit trees, truck and garden vegetable crops, fiber plants, tobacco, vegetable fungi, and industrial micro-organisms. Specific and valuable information was obtained from investigations on the control of the bunchy-top, vascular disease, mosaic and wilt disease of abacá; "man rice," seed-borne and rotten-neck diseases of rice; brown rot, *cadang-cadang*, and anthracnose diseases of mango; *Sclerotium* wilt of peanut; bean mold; kulitis mold; bean blight; leaf spots of strawberry; late blight of potato; and industrial organisms.

Studies on the culture of Philippine edible mushroom with a view to improving the method of preparing spawn and increasing its production, and the isolation of potato strains resistant to blight were continued, and encouraging results have been obtained.

9. *Plant breeding*.—Breeding work and selection of rice, corn, legumes, vegetables, fruit trees, and fiber plants were continued

during the year. Of the non-glutinous lowland rice, the crosses Raminad Strain Nos. 3 and 4 and Ramelon Strain Nos. 1 and 2 are now grown on a commercial scale in Maligaya (Nueva Ecija) and other rice regions. There are also under study 31 different strains of glutinous lowland rice. The rice variety Long Glums Japonica introduced from China headed in 79 days after transplanting, and the two types (Nos. 4 and 5) of rice introduced from Formosa showed promise as they attained a satisfactory height with good-sized panicles.

Thirty-five different varieties and strains of upland rice which had been purified were planted for initial propagation preparatory to subjecting them to comparative yield tests. There were also planted 11 non-glutinous and 4 glutinous varieties for further selection.

The promising abacá hybrids propagated at the new abacá station in Guinobatan, Albay, are: Itom \times Lansigon, Itom \times Maguindanao, Puti Tomatagacan \times Maguindanao, and Puti \times Lansigon.

LOS BAÑOS ECONOMIC GARDEN

There were received at the Garden 65 species and 160 varieties of native plants and seeds, and 164 species and 214 varieties of exotic plants. Experimental projects in the systematic garden, and recording of observations on different plantings, including date of flowering and fruiting and recurrence of pests and diseases; ornamental gardening, renovation and preparation of beds, propagation work, planting, harvesting of seeds, observation on flowering and fruiting of ornamental plants, trimming of hedges and shrubberies, and distribution of plant materials; and quarantining of rice introduced from foreign countries, survey and control of important pests and diseases attacking the different plant cultures were undertaken by the Garden. It realized ₱3,176.50 from the sale of farm products raised therein.

PLANT PROPAGATION ACTIVITIES

The propagation and distribution of seeds and plant materials and demonstration of improved farming methods were carried on in the following propagation stations and seed farms: Central Experiment Station, Manila; Ilagan Tobacco Experiment Station, Ilagan, Isabela; Santa Maria Plant Propagation Station, Santa Maria, Ilocos Sur; Baguio Plant Industry Experiment Station, City of Baguio; Maligaya Rice Experiment Station, Muñoz, Nueva Ecija; Lamao Horticultural Experiment Station, Limay, Bataan; Los Baños Economic Garden, Los Ba-

ños, Laguna; Tanauan Citrus Experiment Station, Tanauan, Batangas; Lipa Coffee-Citrus Station, Lipa, Batangas; Halcon Rubber Reservation, Baco, Mindoro; La Paz Plant Propagation Station, Iloilo City; Gandara Seed Farm, Gandara, Samar; Granja Sugar Cane Experiment Station, La Carlota, Occidental Negros; Mandaue Seed Farm, Mandaue, Cebu; Maridagao Rubber Experiment Station, Pikit, Cotabato; Davao Seed Farm, Davao Penal Colony; Gingoog Lanzon Reservation, Gingoog, Oriental Misamis; and Guinobatan Abacá Experiment Station, Guinobatan, Albay.

AGRICULTURAL EXTENSION ACTIVITIES

Special drives were conducted to encourage the coöperative trial planting of such crops as onion, cotton, and derris. About 2,100 kilos of Yellow Bermuda and 250 kilos of Red Globe onion seeds were distributed to 1,048 coöperators in 35 provinces and 3,316 kilos of cotton seeds to 624 planters in 13 provinces. To give impetus to the silk industry, 11,295 mulberry cuttings were distributed, especially in Cavite, Sorsogon, and Oriental Negros, while 34,000 root stocks of ramie were distributed in Davao alone.

A systematic food production campaign was also launched, particularly in the typhoon-, flood-, and drought-stricken provinces by urging the farmers to plant root crops, vegetables, and palagad or dry season lowland rice to dissipate the imminence of famine due to decreased production of rice and corn. There were distributed to farmers 960,274 cassava cuttings, 11,200 kilos of beans, 1,626 kilos and 33,952 packets of vegetable seeds, most of which were soybeans, bountiful beans, Chinese beans, sitao or Singapore beans, pechay, mustard, radish, cabbage, tomatoes, and eggplant; 541 cavans of palagad seed palay; 479,930 fruit tree seedlings, and budded, grafted, and marcotted plants. Around 186,375 fruit trees were planted, 186,595 pruned, 25,625 budded, 16,264 grafted, and 367,080 treated for pests and diseases, under the supervision of the field personnel of the Bureau of Plant Industry. There are now in operation 40 provincial nurseries and 16 municipal nurseries scattered in 39 provinces. Twelve additional provincial and sub-provincial nurseries, including a number of municipal and private nurseries, are in the process of establishment. Coöperation was extended, not only to farmers, but also to the Philippine Army and the Office of Adult Education.

BUREAU OF ANIMAL INDUSTRY

EXPANSION OF THE SERVICE

During the year 1938, the activities of the Bureau of Animal Industry considerably increased. A new division known as the Livestock Extension Division was organized in the early part of the year. This new unit was created with a view to bringing the Bureau closer to the people.

A unit known as the Inedible Animal By-products Section was also organized.

As a result of the operation of Commonwealth Act No. 118, creating the Livestock Promotion Fund, three new breeding stations were established in Sta. Cruz, Laguna; Sariaya, Tayabas; and Bangued, Abra. Several others are now in the process of establishment in different regions of the Philippines.

On June 21, 1938, Commonwealth Act No. 340, creating the Animal Utilization Service under the Bureau of Animal Industry, was approved. This service will be inaugurated as soon as funds appropriated under the law are released.

Commonwealth Act No. 379, approved on August 23, 1938, confers upon the Bureau the duties of branding and registration of large cattle imported into the Philippines from foreign countries.

ERADICATION AND CONTROL OF ANIMAL DISEASES

The quarantine and mass vaccination of animals proved to be very effective in the eradication and control of animal diseases. The diseases which broke out but were subsequently placed under control during the year were the follownig: rinderpest, anthrax, hemorrhagic septicemia, foot-and-mouth, tuberculosis, surra, glanders, hog cholera; avian pest, fowl cholera, fowl pox, roup, and coccidiosis in chicks; and other minor diseases, such as cases of rabies, contagious abortion, piroplasmosis, joint lameness, epizootic lymphangitis, strangles, tetanus, suspected cattle farcy, foot-mysis, and liverflukes.

MEAT INSPECTION

The meat inspection service provided for under Commonwealth Act No. 82 was carried out in 286 municipalities, including chartered cities. Due to its limited force, the Bureau of Animal Industry found difficulty in the supervision of meat inspectors. As a whole, however, meat inspection has been satisfactorily conducted throughout the Archipelago. The munic-

ipalities concerned have been advised to establish modern municipal slaughterhouses or remodel existing ones and provide them with better facilities, for which purpose, it has been suggested that they apply for loan from the revolving fund of ₱10,000,000 appropriated under Commonwealth Act No. 403. Plans of modern abattoirs suitable for cities and municipalities have been prepared and distributed by the Bureau of Animal Industry.

VETERINARY RESEARCH WORK

The following are the outstanding accomplishments of the Bureau along veterinary research:

(a) Positive determination of the viability of the virus of avian pest in dead birds. The virus can remain alive and infectious as long as eight days in the carcass of a bird that died of avian pest;

(b) Preparation of crystal violet hog cholera vaccine which is already giving very encouraging results in the first few trials in the provinces;

(c) The positive determination that greater immunity is established first, by giving a certain amount of rabies vaccine in multiple injections than by giving the same amount in one injection and second, by giving a bigger dose either in one or multiple injections;

(d) Positive determination of the presence of contagious abortion among the dairy cattle in two dairies, one in Manila and the other in Cebu;

(e) Positive determination that carabaos once infected with surra may not eliminate the trypanosome from their blood for a long period of time, while cattle can recover completely after a few months;

(f) Preparation of a diluent that can keep alive the spermatozoas for 14 days which heretofore could be kept alive for 18 hours only. This discovery makes possible the transportation of the semen of a valuable animal to distant places for artificial insemination thus increasing its serviceability;

(g) Marked improvement in the process of the manufacture of anthrax spore vaccine;

(h) The preparation of tetanus toxoid that can give a liter of 0.1 U. S. unit per cc. to the serum of the ordinary Filipino pony injected with a dose of 10 cc. mixed with 2 per cent aluminum potassium sulphate and 1 U. S. unit when two doses are injected with an interval of 21 to 30 days;

(i) Considerable increase in the production of many of the biological products manufactured by the Bureau; and

(j) Organization of a biochemic section which handles the problems related to drugs; the preparation of diluents and other solutions; and the chemical analysis of specimens for poisoning, of vaccine, sera, blood, and animal tissues for chemical changes, and of animal feeds for their nutritional value.

Investigations and researches have been conducted on virus diseases, bacterial diseases, parasitic diseases, biochemistry, biological products, and forensic diagnosis, most of which are still in progress.

LABORATORY DIAGNOSIS

As in the previous year, a laboratory diagnosis service both for the Government and private parties for the determination and identification of various diseases of livestock, was maintained. A total of 1,230 specimens submitted for diagnosis includes the specimens obtained from experimental animals belonging to the Government. Examinations for poisoning and identification of meat and other materials were conducted and a total of 70 samples was diagnosed.

PRODUCTION OF STANDARD BIOLOGICAL PRODUCTS

The Bureau manufactured the following biological products during the year 1938:

		Quantity	Value
Rinderpest vaccine	doses.....	15,600	₱7,800.00
Hemorrhagic septicemia vaccine	do.....	69,380	6,938.00
Rabies vaccine	do.....	7,975	1,993.75
Fowl cholera vaccine	do.....	27,620	2,762.00
Chicken pox vaccine	do.....	75,500	302.00
Hog cholera virus	do.....	10,644	851.52
Anthrax vaccine	do.....	76,380	7,638.00
Roup vaccine	do.....	29,400	735.00
Swine plague vaccine	do.....	8,960	896.00
Antirinderpest serum	cc.....	27,000	405.00
Antitetanic serum	ampoules....	191	191.00
Tetanus toxoid	doses.....	1,570	785.00
Mallein	do.....	1,380	276.00
Tuberculin	do.....	290	101.50
Anti-hog cholera serum	cc.....	2,795	69.88
Total			₱31,744.65

LIVESTOCK IMPROVEMENT WORK

The work on the upgrading of the native stock was continued, special emphasis having been laid on the development of dairy beef and work animals. The different livestock projects of the Bureau were expanded and the production of more and better kinds of stock was increased to meet the growing demand for breeding animals. The experiments on breeding with a view to developing strains of breeds that can be raised profitably in the Philippines were also continued and the results obtained are very encouraging.

STOCK FARMS AND BREEDING STATIONS

The Bureau continued the operation of the following stock farms, through which it carried its livestock improvement work:

Alabang Stock Farm, Alabang, Rizal.
Boñgabon Stock Farm, Boñgabon, Nueva Ecija.
Dumarao Stock Farm, Dumarao, Capiz.
La Carlota Stock Farm, La Carlota, Occidental Negros.
Ubay Stock Farm, Ubay, Bohol.

Animals for breeding purposes are kept in the breeding stations. In addition to the breeding stations in operation during 1937, three new ones were opened during 1938. The following are the present breeding stations of the Bureau:

Batangas Breeding Station, Batangas, Batangas.
Cebu Breeding Station, Cebu, Cebu.
Basilan Breeding Station, Basilan, Zamboanga.
Laguna Breeding Station, Sta. Cruz, Laguna.
Tayabas Breeding Station, Sariaya, Tayabas.
Abra Breeding Station, Bangued, Abra.

IMPORTATION OF BREEDING ANIMALS

In order to produce better results in the breeding work, more animals were imported into the Philippines for breeding purposes. The importation during the year consisted of 13 Afrikaner bulls, 7 Afrikaner cows, 2 Sussex bulls, 1 British Saanen buck, 3 British Saanen does, 4 British Alpine does, and 12 Manganello (Merino) sheep from South Africa; 2 Ayrshire bulls, 5 Ayrshire cows, 7 White Leghorn roosters and 70 White Leghorn hens from Australia; and 2 Anglo-Nubian bucks, 12 Anglo-Nubian does, 2 Toggenburg bucks, 12 Toggenburg does, 2 Shropshire rams, 12 Shropshire ewes, 2 Black Poland-China boars, 15 Black Poland-China sows, 1 Black Berkshire boar, 5 Black Berkshire sows, 1 Spotted Poland-China boar, and 1 Spotted Poland-China sow from the United States.

For the first time, Afrikaner cattle were introduced into this country in 1938. This breed of cattle is very hardy and thrives well under varying conditions in South Africa, which are similar to those of the Philippines. In view of the large size and hardiness of the animal, it is believed that this breed can well be used in this country for the improvement of native beef cattle.

LIVESTOCK PROJECTS

1. *Horses*.—Experiments on the improvement of the native pony by the use of Arab stallions were continued. Free breeding service was extended in four of the breeding stations. The total stud fees collected in 1938 amounted to ₱8,265 which exceeded the total sum collected in 1937 by ₱2,060. The stallions rendered approximately 4,719 services, and as far as could be ascertained 122 foals were begotten out of natural breeding and 43 of artificial insemination.

2. *Cattle*.—Native stock for beef purposes will be greatly improved with the importation at the middle of the year of seven Afrikaner cattle and a Sussex bull. This newly imported stock showed certain degrees of adaptability under local conditions. The cross between the Ayrshire cattle and the Nellore or the Nellore-native grades for the development of dairy type produced animals which yielded as high as 18 to 21 liters of milk daily.

3. *Carabaos*.—A dairy herd of native carabaos was started in the Alabang Stock Farm. The experiment has so far shown that, under favorable conditions, a caraballa may produce as high as four liters of milk daily.

4. *Swine*.—The increased demand for breeding pigs in 1938 doubled that of the preceding year and although the capacity of the hog plant of the Bureau was enlarged and the production increased, the farm was unable to meet the demand. The experiments on the Poland-China-Batangas cross have produced fast-growing animals suitable for commercial purposes.

5. *Sheep and goats*.—With the importation of Manganello (Merino) from South Africa and Shropshire sheep from the United States, the sheep project of the Bureau was enlarged during the year. A new shipment of Anglo-Nubian, Toggenburg and British Saanen, and Alpine goats has reinforced the goat herd of the Bureau.

6. *Poultry*.—The poultry projects in the Alabang Stock Farm and Cebu Breeding Stations have been the main source of breeding fowls all over the Philippines. From the 1,200 laying hens



at the Alabang Stock Farm, a production of 775 eggs a day has been attained, which shows the superiority and quality of the chickens found in the farm. This production is a result of intensive study on pedigree work of the flock.

PASTURE GRASSES AND FORAGE CROPS

Locally grown feeds compounded from home-grown materials have been produced to take the place of feeds imported from foreign countries to feed imported animals. The result so far has proved very satisfactory.

The production of hay out of rice, tapilan, soybean, and the newly imported mat bean has been started in the different farms of the Bureau. All arable lands were planted to forage grasses and forage crops, besides Napier, Guinea, Uba cane, and other economic plants. Pasture improvement in all forms was effected.

EXPERIMENTS ON THE PREPARATION OF ANIMAL PRODUCTS

To carry out the program of work directed towards the industrial utilization of animal by-products, there was organized in the Animal Products Division of the Bureau a unit known as Inedible Animal By-products Section. Experiments on the preservation, curing, and utilization of milk and meat products were continued and satisfactory results were obtained. The production on semicommercial scale of meat and milk products, such as ham, bacon, sausages, butter, cheese, etc., constituted the major part of the routine work performed along this direction. The resulting finished products were sold or disposed of to the public. During the year under review, the total gross income realized from the sales of various finished meat and milk products amounted to ₱28,546.10.

The execution of the various projects was made possible by the operation of a revolving fund of ₱15,000 set aside from the sum appropriated under Act No. 3953 known as the "Promotion and Development of New Industries Fund."

LIVESTOCK EXTENSION SERVICE

As stated elsewhere in this report, the Livestock Extension Division is a new creation. It was only formally organized at the beginning of 1938 when funds for its organization were appropriated. This new service is primarily designed to acquaint the people with the mission and activities of the Bureau of Ani-

mal Industry; to place at their disposal the results of its investigation, researches, and accomplishments; to disseminate useful information on the ways and means of controlling and eradicating animal diseases, on the proper feeds and feeding, care and management, breeds and breeding of animals; and to familiarize them with the importance of propagating different forage crops and of conserving and improving native pastures. To systematize the work, the country was divided into 14 livestock extension districts, each comprising two or more provinces under the charge of an extension officer. A detailed survey of the conditions obtaining in each province is being made and suitable regions for animal production are selected to serve as promotional centers. House-to-house visits were made by the extension men to encourage and help the people to raise and produce more and better kinds of animals, particularly swine and poultry, through proper methods of feeding, care, and management.

During the year, extension service was rendered to three hundred forty-eight commercial and semicommercial, and six hundred ninety-one backyard chicken projects in thirty-seven provinces.

Through the Livestock Extension Service, the Bureau was able to participate in the 1938 Livestock Show in the National Agricultural and Industrial Exposition and in 11 provincial agricultural expositions and fairs held in different provinces.

This unit also took charge of the distribution of the different scientific publications. About 25,000 bulletins, leaflets, administrative orders, annual reports, journals, and monthly service records were distributed during the year.

LIVESTOCK PROMOTION WORK IN MINDANAO AND SULU

In accordance with the policy announced by His Excellency, the President of the Philippines, for the economic development of Mindanao and Sulu, the Bureau of Animal Industry organized during 1938 a branch office in said region under the charge of a competent veterinarian to take charge exclusively of the livestock promotion work in that part of the country. A survey of the different regions of Mindanao is being made to determine the kinds of livestock that should be raised in any particular province or district. It is proposed to establish a stock farm in Mindanao and Sulu and a breeding station in each of the provinces of Mindanao as funds become available for the purpose.

BUREAU OF FORESTRY

GENERAL SURVEY

There was a slight decrease in the total quantity of timber cut compared with that of last year, and a decline in the lumber and timber export principally due to the limitation in their importation as a result of the Sino-Japanese conflict.

The capital invested by Filipinos in the lumber industry and the number of sawmills established have increased.

There were more licenses issued this year for the cutting and collection of timber and other forest products. There was an increase in the number of permits issued for the use of forest lands, a corresponding increase in the total area granted under such permits and the rentals collected therefrom.

Land classification was undertaken as usual. The establishment of more national parks and forest reserves has been pushed through.

Forest research was carried out to meet the exigencies of the service, although to a limited extent only because of handicaps in funds and personnel.

The reforestation work of the Bureau has been extensively and intensively carried out, making possible the employment of more than 15,000 laborers. The number of reforestation projects has been increased from 17 to 29 and there are now reported growing 73,593,000 trees over an area of 6,938 hectares.

LUMBER INDUSTRY

From January 1 to October 31, 1938, the quantity of timber cut from the public forest by licensees aggregated 2,005,659.74 cubic meters as compared with 2,569,035.12 cubic meters cut during the whole year 1937.

There were 141 sawmills and seven machine-logging operations without sawmills with a total lumber production of 291,946,292 board feet (as of October 31, 1938) as compared with 124 sawmills and seven machine-logging operations with a production of 315,870,452 board feet during the whole year 1937.

1. *Investment.*—The majority of sawmills and machine-logging operations without sawmills are owned by Filipinos, but the Americans hold the biggest investment in the lumber industry. However, Filipino capital has increased its participation in the lumber industry. The percentage of purely Filipino capital constitutes 30.1 per cent of the total investment as compared with 25.6 per cent in the previous year. The capital

investment by nationalities is as follows: Americans, 40.9 per cent; Filipinos 30.1 per cent; Chinese, 10.2 per cent; British, 4.9 per cent; Japanese, 4.1 per cent; American-Filipino, 1.2 per cent; American-Filipino-German, 0.4 per cent; and Filipino associations with foreigners, 7.2 per cent.

2. *Foreign markets.*—There was a general decline in lumber and timber trade with foreign countries, especially with Japan and China. The total export during the period from January 1 to November 30, 1938, was 141,380,680 board feet as compared with the export of 251,694,880 board feet during the whole year 1937. The decrease was due to the curtailment of exports to Japan by the Japanese Government because of the Sino-Japanese conflict and the consequent decline in the Chinese market and to some extent to the increased freight rates of lumber and timber to Continental Europe and the United States and the threat of a European War.

3. *Local markets.*—The domestic market was active although prices remained at low level. This was a direct reflection of the active residential construction and large-scale construction program of the Government. Considerable quantity of logs formerly intended for export to Japan and China was sawn and sold locally, the low prices notwithstanding.

SCALING

The total amount of timber scaled by forest officers as of October 31, 1938, was 1,924,943.93 cubic meters with corresponding forest charges of ₱1,748,729.21 as compared with 2,461,352.99 cubic meters with forest charges of ₱2,116,748.82 for the whole year 1937. Of the 148 licensed sawmills and machine-logging operations, 111 were provided with regular scalers, 18 were visited only periodically by forest officers, and the rest manifested their own timber.

The scaling work in Manila was more active than last year. The total quantity of timber scaled as of November 30, 1938, was 22,666.66 cubic meters with corresponding forest charges of ₱50,030.59 as against 21,523.69 cubic meters with forest charges of ₱45,615.52 for the whole year 1937.

GRADING AND LUMBER INSPECTION

There were 2,769,063 board feet of lumber and timber inspected with corresponding inspection fee of ₱1,824.20. These figures cover the period from January 1 to November 30, 1938.

UTILIZATION OF FOREST PRODUCTS

1. *Ordinary and gratuitous licenses in force.*—There were 8,666 forestry licenses in force during the year, including ordinary timber licenses, ordinary minor forest products licenses, private gratuitous licenses, public gratuitous licenses, miners' gratuitous licenses, ordinary wild plants dealers' licenses, gratuitous wild plants licenses, special wild plants permits for educational or scientific purposes, collectors' wild plants licenses, and permits to transport wild plants for personal uses.

2. *License agreements.*—Three timber license agreements for a period of ten years each were granted during the year. There were in force 18 license agreements for timber and two minor forest products license agreements.

3. *Forest products cut, collected, and invoiced.*—During the period from January 1 to November 30, 1938, there were 2,043,494.56 cubic meters of timber cut, collected, and invoiced from the public forest. Of this quantity 2,005,659.74 cubic meters of timber are for commercial and industrial purposes; 17,359.42 for mining; 8,127.76 for public works; and 12,347.64 for domestic purposes.

The minor forest products invoiced from January 1 to October 31, 1938 were: 146,193.06 cubic meters of firewood; 8,871.43 cubic meters of charcoal; 1,212,702 kilos of tanbarks; 6,847,919 kilos of cutch; 638,031 kilos of Manila copal; 8,992 kilos of Manila elemi; 12,368 liters of oleoresins; 883,488 kilos of split rattan; 3,574,853 linear meters of unsplit rattan; 31,204 kilos of diliman; 22,286 kilos of Kamagsa; 1,161,655 kilos of nipa leaves; 347,522 kilos of lumbang kernels; 81,597 kilos of lumbang nuts and others.

4. *Forest charges.*—The total forest charges collected amounted to ₱2,482,835.14. This includes the income from national parks in the amount of ₱7,008.31. Forest charges pending collection amounted to ₱1,159,955.55. Of this amount, ₱97,300.57 represents forest charges on illegal forest products submitted for collection.

5. *License cash bond deposits and fees.*—The total amount of bond deposits forfeited in favor of the Government was ₱1,911.38, while ₱16,445.97 has been refunded. A total of ₱262,767.86 as license cash bond deposits was on hand. The amount of ₱33,421.92 was paid to the Auditor General to the credit of the creditors' unclaimed balances. A total of ₱297,528.94 was forfeited since the inauguration of the license bond deposits in 1920.

LAND CLASSIFICATION

There were received 312 requests for land classification, of which 86 were acted upon. There were 128 land classification projects handled, of which 53 were certified, seven cancelled, and one combined with other projects, leaving 67 projects pending action.

The 53 projects certified covered an aggregate area of 73,248.4077 hectares out of which only 11,870.1 hectares in 11 projects were declared agricultural lands, and 61,378.3077 hectares for the remaining 42 projects were certified for subdivision by the Bureau of Lands.

FOREST VIOLATIONS

There were detected as of November 30, 1938, 1,636 cases of forest violations committed by licensees and 10,781 cases of forest violations committed by nonlicensees involving the amount of ₱87,129.31 and ₱174,988.51, respectively, or a total of ₱262,117.82.

Illegal caiñgins.—The Bureau detected 1,766 cases of illegal caiñgins covering a total area of 2,029.68 hectares. The forest products destroyed totalled 128,234.36 cubic meters of timber; 7,052.06 cubic meters of firewood; 943,000 pieces of bohos; and 22,952 seedlings of Pines and Dipterocarps species, the total forest charges of which were ₱194,680.54.

SPECIAL USE PERMITS

The number of applications for special use of forest lands received during 1938 was 2,968. These, together with the 3,702 applications at the beginning of the year, made a total of 6,670 applications handled during the year. Of this number, 2,897 applications have been acted upon. The number of special use permits and leases in force in 1938 was 3,116 with a total area of 97,174.06 hectares. In addition to the above, 3,024 applications for permits to make caiñgins have been handled.

Rentals.—The income realized from rentals and fees from special use of forest lands was ₱54,032.21. There was collected also the sum of ₱16,212.46 as bond.

FOREST LAND REGISTRATION CASES

There were received 759 ordinary land registration cases involving 1,749 parcels of land having an aggregate area of 15,501.1535 hectares. Oppositions were filed only against 80 cases involving 257 parcels with a total area of 9,257.0049 hec-

tares. After field investigation, 242 parcels with an area of 9,141.7108 hectares were withdrawn because they were of no forestry value. Three parcels involving 496.27 hectares were adjudicated to the claimants and six parcels with an area of 35.8531 hectares were declared public lands. There are pending hearing cases involving 378 parcels covering 55,054.611 hectares.

In cadastral hearings there were received 89 cases involving 22,628 lots covering 112,152.6178 hectares. The Bureau of Forestry filed claims to 4,671 lots involving 70,840.1614 hectares. No claims were filed on 1,287 lots covering 15,883.1243 hectares because they contain no forestry value. At the end of the year the total number pending hearing is 69,309 lots with an area of 566,008.874 hectares.

PRIVATE WOODLAND REGISTRATION

There were 290 certificates of registration checked. One hundred forty-seven applications for registration of titles under section 1829 of the Administrative Code were received. These, together with the 50 applications pending at the beginning of the year, made a total of 197 applications handled. Of these, 141 were finally acted upon leaving 56 pending action at the end of the year. Of the 141 applications acted upon, 129 were issued certificates of registration covering 140 parcels of land with an aggregate area of 5,651.71 hectares of highland forest, 437.9 hectares of firewood land, 192.18 hectares of mangrove swamp and 6,387.63 hectares of nonforest lands, or a total of 12,669.42 hectares. Twelve applications were disapproved and 22 provisional certificates covering 28 parcels of land with an area of 5,400.85 hectares were issued. There was collected ₱710 as fees for private woodland registration.

FOREST CLAIMS AND CONFLICTS

Three hundred twenty-eight cases of claims of forest land, 242 of which were formerly opposed, were received. These, together with the 208 claims pending at the beginning of the year, made a total of 536 claims handled. There were 459 claims finally acted upon, leaving 77 cases pending action at the end of the year.

FOREST RESERVES

Eleven forest reserves, with an area of 168,677.55 hectares, were established. There are at present 80 forest reserves with a total area of 1,073,713.56 hectares.

Timberland.—There were established 24 timberland blocks with an aggregate area of 28,532 hectares. Sixty-two blocks with a total area of 4,119.925 hectares were reverted from alienable and disposable to the category of forest lands. There were, therefore, 86 blocks with an aggregate area of 32,651.925 hectares established.

NATIONAL PARKS

Six national parks, containing a total area of 23,270.3488 hectares were proclaimed, making a total of 25 established national parks with an aggregate area of 167,553.3857 hectares.

The total income from the parks amounted to ₱15,569.31 while the total expenses incurred for improvements was ₱10,033.28.

COMMUNAL FORESTS

There were established 41 parcels of communal forests; 28 parcels, amended; 15, cancelled; 4, closed to cutting; 90, inspected; and 1, opened to commercial exploitation. At the end of the year, 1,939 parcels containing an area of 267,497.73 hectares were in force. Of the 311 cases pending action, 196 were pending establishment; 98, pending amendment; and 17, pending cancellation. A total of 53,645.70 cubic meters of timber, 21,800 pieces of bohos, 47,180 pieces of tañgal and bacauan, and 1,540 bundles of nipa shingles was cut from communal forests.

COMMUNAL PASTURES

Two parcels of communal pastures with an area of 678.20 hectares were established, making a total of 66 parcels with an aggregate area of 13,503.65 hectares, located in 38 municipalities and municipal districts.

FOREST RESEARCH

There were started 20 new projects distributed as follows: 3 on silviculture; 3 on management; 2 on protection; 7 on utilization; 4 on dendrology; and 1 on economics. These, with the 147 projects in progress at the beginning of the year, give a total of 167 projects handled during the year, 13 of which were completed, 12 published, and additional data secured for the rest. Of the 13 projects completed, 2 are under silviculture, 2 under management, and 3 each under protection, dendrology, and utilization.

Of the total 36 pending projects handled by the Section of Forestry of the National Research Council of the Philippines, 2 were completed and 2 were published. A total of 33 is in progress at the end of the year.

1. *Dendrology*.—Field identification of 128 species of plants consisting of trees, shrubs, and ornamentals, belonging to 110 genera and 47 families was made in Camp Stotsenburg, Pampanga; 91 species and 2 varieties belonging to 82 genera and 38 families in Biak na Bundok at Mandaluyong, Rizal; 41 species belonging to 39 genera and 18 families in Wack-Wack and Country Club Golf Course. Ninety species belonging to 74 genera and 58 families were received from the different forest stations and identified.

2. *Forest entomology and pathology*.—There were collected 335 insect specimens representing 94 species. There is now a total of 41,356 insect specimens representing 1,725 species in the present collection.

There were also collected locally and received from the fieldmen 217 specimens of fungi and there is now a total collection of 943 specimens of fungi of which 210 were identified species.

3. *Botanical collection*.—A collection of 115 botanical specimens was made at the University of the Philippines Land Grant, 28 of which have corresponding wood specimens. Another collection was made at the western portion of Mount Mariveles within the jurisdiction of Bagac, Bataan.

There is in the herbarium a total of 5,028 botanical specimens consisting of 2,288 species, 1,009 genera, and 171 families.

REFORESTATION

Under the various Acts appropriating funds for reforestation purposes, the total amount of ₱571,268.20 was available during the year.

From the passage of Act No. 3283 in 1927, a total area of 2,054,490 hectares has been extensively surveyed out of the 5,270,805 hectares of cogon lands in the Philippines. A total area of 495,252.2 hectares was studied, and 1,176,377.99 hectares examined, out of which 238,406.84 hectares and 571,760.73 hectares, respectively, need planting.

The total amount of seeds distributed to all reforestation projects during the year was 87,456.23 liters.

Twelve new projects were established which, together with the 17 in previous years, give a total of 29 projects in progress distributed as follows: 21 in the watersheds of the Agno, Pampanga, Cagayan, and Abra rivers and rivers in the Ilocos regions and other places; 3 in established forest reserves; and 5 in national parks.

In all of the projects, there is now a total of 6,938 hectares of plantations, 1,640 hectares of which are newly planted to seedlings, 4,075 directly seeded, 563 fully stocked, and 660 hectares partially stocked. In all of the plantations, there is now a total of 73,593,000 trees living, of which 969,700 are over a year old. The total area of nurseries in these projects is about 984,600 square meters, of which 186,600 square meters are for seed beds, 69,400 for transplanting beds, and 728,600 for other purposes.

The total amount of seeds handled was 249,830 liters of which 77,780 liters were sown in seed beds and 55,640 directly sown in the plantations.

The total number of seedlings handled was 16,870,900 of which 4,070,160 were set out in the plantations.

FOREST SURVEYS

Surveys undertaken in accordance with the procedure of the Bureau of Forestry consisted of 6,271 indices of field notes involving 22,766.36 kilometers and 6,559 hectares of forest valuations.

MAPPING AND DRAFTING

A total of 248 new cases for compilation and preparation of maps was received which, together with the 49 cases pending at the beginning of the year, gives a total of 297 cases for action. Of this number, 245 cases embodied in 223 maps were acted upon. There were also prepared under special request 317 cases of the unclassified miscellaneous maps and 158 isolated Bureau of Lands plans traced in connection with opposed General Land Registration cases. Vegetative data from 3,409 sketches, the boundaries of 52 land classification projects, 10 forest reserves, 3 national parks, 78 communal forests, and 1 communal pasture were compiled in addition to the 58 groups of mining claims and 67 isolated Bureau of Lands plans which were verified and located on progressive forest maps.

Copies of different kinds of maps numbering 13,721 were printed of which 11,916 were distributed for administrative use, 188 bought by the public, and 1,617 filed. In addition 411 copies of the lithographic forest maps of the Philippines were distributed for administrative use and 48 bought by the public. There were received 3,991 sketches for preliminary map data which, with the 63,577 accumulated in previous years, made a grand total of 67,568 sketches.

EXTENSION SERVICE

During the period from January 1 to November 30, 1938, the Bureau of Forestry personnel delivered 300 formal and 1,387 informal talks, or a total of 1,687 talks to hearers numbering 181,289.

There were planted throughout the Philippines, from January 1 to November 30, 1938, 917 trees in connection with the celebration of the Bird and Arbor Day and the third anniversary of the Commonwealth, including those planted for beautification purposes and commemoration by distinguished personages.

As in previous years, the Bureau of Forestry extended its cooperation to private individuals as well as public or semipublic entities in the matter of tree planting, tree pruning, and general beautification work.

The public relations work and educational campaign of the Bureau were actively undertaken. News items on the important program of activities or projects on hand were broadcast over the radio by the National Information Board.

COÖPERATIVE PLANTING PROJECTS

1. *Tagaytay*.—The forest nursery at Tagaytay which was established in coöperation with the Bureau of Public Works for the necessary beautification and tree planting of the place has been maintained throughout the year. The nursery covers an area of about 9,298.5 square meters. There have been raised 17,007 seedlings of different species and 4,832 ornamental plants. There were set out along the provincial road, resthouse site and the waterworks site, 1,156 seedlings.

2. *City planting in Baguio*.—The planting of trees, ornamental plants and shrubs along the drives and in the parks in the City of Baguio was continued. A total of 22,292 trees and ornamental plants was set out.

3. *Mambucal Health Resort*.—The coöperative planting project and beautification work in Mambucal, Occidental Negros, which were started by the Bureau of Forestry on May 22, 1933, in coöperation with the Provincial Government and left out by the Bureau in the latter part of the year 1936, were again resumed in conjunction with the opening of the Canlaon Reforestation Project on June 20, 1938. The officer in charge of the Canlaon Reforestation Project has been assigned to take charge also of the beautification of the Mambucal Health Resort.

BUREAU OF LANDS

ADMINISTRATION OF PUBLIC LANDS

1. *Public lands concession: new applications.*—More public land applications have been received during the year covered by this report than in the preceding year. The applications received during the year are classified as follows:

Kind of applications	Number	Area in hectares
Homestead	3,785	33,709.5454
Additional homestead	147	994.9814
Free patent	853	5,152.0123
Additional free patent	25	76.4229
Sales	279	8,848.5106
Additional sales	5	60.5000
Miscellaneous sales	2	.3150
Insular Government property sales.....	177	397.5015
Townsite sales	3	.1463
Special purchase	4
Lease	23	9,417.0068
Miscellaneous lease	290	115.4519
Insular Government property lease.....	3
Reclaimed land lease	2
Foreshore lease	257
Revocable permit	412
Total	6,267	58,772.3941

Many applications for townsite lots and other lands classified as residential, commercial, and industrial have to be turned down in view of the fact that the Secretary of Justice has not yet rendered an opinion on whether lands of this nature may, under Article XII of the Constitution, be sold.

A marked interest in commercial lots especially in the waterfront of Manila and Cebu, has been noted, but applicants for lots in the Manila Reclamation have been disappointed inasmuch as all the blocks in the Port Area district of the City of Manila have already been leased to private parties or reserved for government purposes.

2. *Approval of applications.*—The number of applications approved during the year is 6,084 only, covering an area of 65,022.0042 hectares as compared with 8,337 applications approved in 1937. Of these applications approved during the year 4,248 are for homesteads, 1,087 for free patents, 291 for sales, 48 for leases, and 410 for revocable permits.

In addition, 48 lease contracts have been prepared during the year under review. The following table shows the distribution of these contracts as compared with those of 1937:

Kind of contracts	Number of contracts	
	1937	1938
Agricultural land leases.....	15	8
Foreshore land leases	20	17
Reclaimed land leases	5
Miscellaneous land leases	10	21
Insular Government property land leases.....	2
Total	50	48

3. *Issuance of patents.*—Graphically stated there were issued 8,722 patents in 1938 as compared with 8,504 patents issued in 1937.

4. *Other actions on public land applications.*—In addition to the acknowledgment and approval of new applications and the issuance of patents to applicants who have complied with all legal requirements, a total of 1,890 public land applications covering an area of 50,996.3809 hectares has been rejected during the year, which is much less than the number of applications rejected during the year 1937. This was brought about by the policy of accepting applications only for surveyed lands. Under the present policy, when an application is accepted by the Bureau, it is first ascertained whether the land is available for disposition so that if the application is ever rejected, it is no longer for any reason unknown to the Bureau at the time the application was filed but for reasons attributable to the applicant alone.

The following table shows the different actions taken during the years 1937 and 1938 on public land applications, the number of such applications, and the area covered thereby:

Action	1937		1938	
	Number of applications	Area in hectares	Number of applications	Area in hectares
Received.....	5,292	76,784.5013	6,267	58,772.3941
Approved.....	8,337	99,681.9531	6,084	65,022.0042
Rejected.....	3,309	78,574.7630	1,890	51,096.3809
Cancelled.....	1,319	16,806.1785	1,130	17,349.7133
Patented.....	8,504	85,284.7366	8,722	97,727.4433
Reinstated.....	864	18,456.1164	476	11,620.3070

5. *Public land subdivisions.*—To keep up with the development plan for Mindanao and to meet the demands for surveyed lots in other places of the Philippines, as many subdivisions as were consistent with funds available for the purpose were undertaken. Notable among these are the lots for homesteads along the

Davao-Cotabato Road which were surveyed during the year; Mlang Subdivision which is in progress; the Banzalan Subdivision which was completed also in 1938; the Cebuano Barracks Subdivision which is partially completed; and the Maganoy and Buluan Subdivisions which are in progress. The subdivisions in Tagum and along the Davao-Agusan Road are attracting numerous homeseekers.

While activities in this regard in Luzon and Visayas are not as intensified as those in Mindanao, the survey of lands in places where it is believed the general welfare of the masses will be served was not neglected. In Cagayan, where the need for surveyed lots is urgent, there are the Mallig Plains and Camalaniugan Subdivisions; in Pangasinan, the Mangatarem Subdivision; in Pampanga, the Arayat Subdivision; in Occidental Negros, the Haba-Tabla Valley Subdivision; and in Nueva Vizcaya, the Pinappagan, Sta. Fe, Bagabag, and Bambang Subdivisions. Most of these projects have been undertaken to meet the demands of actual occupants.

6. *Public land investigations.*—The investigation personnel of the Bureau has been able to accomplish 32,014 investigations of various kinds during the year. At the same time, 29,727 new orders have been issued. While, therefore, at the beginning of the year, there were only 12,700 investigation orders pending execution, there are still 12,545 orders pending at the close of the year classified as follows: preliminary, 3,325; final, 2,972; claims and conflicts, 1,955; and miscellaneous, 4,293.

7. *Public land collections.*—The public land collections for the year 1938 surpassed all previous records. The Central Office alone collected ₱525,391.84 as against ₱443,223.32 for 1937.

The following table shows the classification of the collections made for 1937 and 1938:

Nature of collection	1937	1938
Homestead fees on approved applications	₱43,201.16	₱53,749.50
Sales payment	106,788.83	112,176.83
Interest on deferred payment	5,320.57	6,276.34
Lease rentals	196,558.29	196,257.71
Fees on revocable or provisional permits	84,571.54	30,672.95
Payment on Baguio townsites	7,685.37	25,711.00
Sale of compiled public land laws and regulations	85.20	89.08
Payment for certified copies and affidavit fees	2,671.06	3,197.75
Undistributed collections	13,931.45	9,007.70
Deposit for bids on sales applications	19,882.01	29,720.86
Deposit for bids on lease rentals	5,224.26	4,651.76
Deposit for publication	6,834.57	5,922.92
Deposit for survey	373.00	908.00
Accounts payable	84.09	47,037.97
Sales of miscellaneous pamphlets (log book, etc.)	.64	.20
Postage	11.28	11.27
Total	₱443,223.32	₱525,391.84

ADMINISTRATIVE SETTLEMENT OF CLAIMS AND CONFLICTS OVER PUBLIC LANDS

1. *Decisions and orders; motions and petitions for reconsideration.*—During the year the Bureau rendered 6,003 decisions and orders as compared with 5,725 decisions and orders rendered during the preceding year. As usual efforts have been exerted to effect as many amicable settlements as possible of the pending cases.

Notwithstanding the large number of decisions and orders released during the year, only 326 motions or petitions for reconsideration have been received.

2. *Orders of investigation and reinvestigation.*—There were issued 2,372 orders of investigation and reinvestigation of public land claims and conflicts during the year. In addition, 5,084 miscellaneous communications regarding public land controversies were released.

ADMINISTRATION AND DISPOSITION OF FRIAR LANDS

1. *Sale of vacant lots.*—A total of 145 lots containing an area of 143.4 hectares and valued at ₱27,821 was sold during the year after the necessary subdivision has been made in accordance with Commonwealth Act No. 32. The area of friar lands remaining undisposed of has, however, considerably increased during the year in view of the surrender by the Archbishop of 17,260.815 hectares of the San Jose Estate in Mindoro, as a result of the amicable settlement of Civil Case No. 44937.

2. *Sale contracts.*—A total of 152 sale contracts has been executed and approved during the year. Of this number, 145 contracts cover lands sold during the year while seven contracts were revised to conform to the change in the area and, consequently, also the purchase price of the land covered thereby as a result of the rectification survey made.

Sale contracts involving 119 lots with a total area of 18,429.5113 hectares valued at ₱626,244.17 were cancelled during the year in view of the purchasers' failure to pay installments due. Most important among these was that one issued in the name of the Mindoro Sugar Company for a total area of 17,260.815 hectares valued at ₱563,490. On the other hand, 34 contracts have been revived, the corresponding purchasers having made payments to justify the continuation of their contracts.

3. *Assignments and transfers*.—A total of 247 assignments of sale contracts involving the same number of lots has been approved during the year. At the same time, 62 lots whose purchasers died already have been ordered transferred to their legal heirs.

4. *Deeds of conveyance*.—There were issued during the year 769 deeds of conveyance covering a total of 2,002.0593 hectares valued at ₱363,589.83. This leaves a total of 2,945 lots containing an area of 5,338.4647 hectares fully paid according to the original contracts, but not yet finally conveyed to the purchasers.

5. *Collections*.—During the year, a total amount of ₱211,592.61 was collected on friar lands. These collections constitute payments of installments, interests on deferred payments, irrigation fees, and miscellaneous receipts.

LAND REGISTRATION AND OTHER LEGAL WORK

1. *Cadastral proceedings (Acts Nos. 2259 and 3327)*.—During the year, 26 petitions for the institution of cadastral proceedings were transmitted to the Solicitor-General for filing in the proper courts, as against 22 petitions sent in the next preceding year. The petitions filed in 1938 involved 17,640 lots with an aggregate area of 243,649 hectares, while those instituted in 1937 involved 19,889 lots with a total area of 48,529 hectares.

2. *Compulsory registration proceedings (sections 53 and 87 of Commonwealth Act No. 141)*.—There were also transmitted to the Solicitor-General for filing in the proper courts 55 petitions for compulsory registration proceedings involving 393 lots with a total area of 17,241.1902 hectares as compared with 30 petitions sent in 1937 which involved 78 lots covering an aggregate area of 59,331.034 hectares.

Some of these proceedings were instituted for the settlement and adjudication of the titles to lands which are believed to be of the public domain but are illegally occupied by persons whose rights thereto are open to question and who would not take the initiative of applying for the registration of said lands in their names. Others refer to public lands reserved by Executive Proclamations for public purposes, such as for school sites, market sites, military training camp sites, landing fields, experimental station sites, etc. Some refer to public land subdivisions.

3. *Claims and requests for amendment to petitions.*—There were filed in 1938 in the various courts of first instance, 421 claims and 54 requests for amendment to petitions in cadastral and compulsory registration cases as compared with 204 claims and 35 requests for amendments filed in the preceding year.

4. *Examination of ordinary registration "expedientes."*—A total of 609 applications for registration and confirmation of titles to lands was received and examined as compared with 591 applications received and examined in 1937. Of the applications examined in 1938, 108 which involved an aggregate area of 12,490.6091 hectares were opposed while 501 which concern a total of 3,149.7064 hectares were not opposed.

5. *Examination of court decisions, orders, etc.*—During the year under discussion, the Bureau received 1,777 decisions and orders of the different courts of first instance in registration cases, 687 of which were on ordinary registration, 1,036 on cadastral, and 54 on compulsory registration proceedings.

ISOLATED LAND SURVEYS

1. *Surveys ordered to public lands surveyors.*—The following statement shows comparatively the standing of isolated land surveys during the years 1937 and 1938:

	1937	1938
On hand January first	9,883	8,530
Ordered during the year.....	8,879	9,954
Completed during the year.....	10,232	11,021
On hand December thirty-first.....	8,530	7,463

2. *Survey returns received in Manila.*—The number of survey returns received in Manila from January 1 to December 31, 1938 as compared with those received during the same period of 1937, is as follows:

Year	Private lands (A)	Public lands (A)	Miscellaneous lands (A)	Total (A)	Private lands (B)	Public lands (B)	Miscellaneous lands (B)	Grand total	
								Surveys	Parcels
1937.....	2,644	30	440	3,114	800	9,197	235	13,346	27,100
1938.....	4,767	12	415	5,194	1,349	9,316	354	16,215	37,142

(A) Surveyed by private land surveyors.

(B) Surveyed by Bureau of Lands surveyors.

3. *Projection on cadastral maps.*—The number of surveys projected on cadastral maps for the years 1937 and 1938 is as follows:

Kind of land survey	1937		1938	
	Surveys	Parcels	Surveys	Parcels
Private (A).....	1,541	6,132	2,138	6,002
Private (B).....	54	111	48	114
Public.....	5,068	5,887	5,886	6,801
Miscellaneous.....	919	2,602	1,087	2,846
Total.....	7,582	14,732	9,159	15,763

(A) Surveyed by private land surveyors.

(B) Surveyed by public land surveyors.

4. *Computations on isolated land surveys.*—The following tables show the comparative accomplishment in computations of isolated land surveys outside and within cadastral projects during 1937 and 1938:

Surveys outside cadastral projects

Class of surveys	Completed during 1937		Completed during 1938		On hand on December 31, 1938	
	Surveys	Parcels	Surveys	Parcels	Surveys	Parcels
Private lands (A).....	31	86	32	74	8	14
Private lands (B).....	1,384	4,498	2,157	5,112	1,190	2,065
Public lands (A).....	4,654	5,524	5,745	6,561	202	870
Public lands (B).....	22	24	14	22	13	16
Miscellaneous lands (A).....	575	1,060	722	1,283	286	698
Miscellaneous lands (B).....	79	249	131	1,058	83	151
Total.....	6,745	11,441	8,801	14,110	1,782	3,309

Surveys within cadastral projects

Class of surveys	Completed during 1937		Completed during 1938		On hand on December 31, 1938	
	Surveys	Parcels	Surveys	Parcels	Surveys	Parcels
Private lands (A).....	429	2,026	709	2,841	188	959
Private lands (B).....	741	4,092	1,313	8,626	185	1,339
Public lands (A).....	4,076	5,191	3,601	4,625	677	782
Public lands (B).....	9	14	7	7	5	8
Miscellaneous lands (A).....	81	698	220	1,489	44	687
Miscellaneous lands (B).....	234	819	249	872	44	89
Total.....	5,570	12,840	6,099	18,460	1,143	3,864

(A) Surveyed by public land surveyors.

(B) Surveyed by private land surveyors.

5. *Preparation of plans.*—The isolated surveys which were finally completed and for which plans have been prepared and approved by the Director of Lands during the year are shown in the following table:

Class of surveys	On hand January 1, 1938		Received January 1 to December 31, 1938	
	Surveys	Parcels	Surveys	Parcels
Public land surveys (A).....	74	259	5,772	6,649
Public land surveys (B).....	0	0	25	30
Private land surveys (A).....	6	23	41	97
Private land surveys (B).....	35	503	4,082	10,174
Government land surveys (A).....	2	13	40	32
Government land surveys (B).....	6	22	54	332
General land surveys (A).....	59	141	681	1,528
General land surveys (B).....	6	25	373	2,366
Total.....	188	986	11,068	21,497

Class of surveys	Completed January 1 to December 31, 1938		Returned to surveyors for tracing		On hand December 31, 1938	
	Surveys	Parcels	Surveys	Parcels	Surveys	Parcels
Public land surveys (A).....	5,750	6,609	-----	-----	96	299
Public land surveys (B).....	13	18	12	12	0	0
Private land surveys (A).....	42	108	1	6	4	6
Private land surveys (B).....	1,992	5,623	2,000	4,697	125	857
Government land surveys (A).....	41	329	1	5	0	0
Government land surveys (B).....	33	209	27	145	0	0
General land surveys (A).....	622	1,447	0	0	118	222
General land surveys (B).....	269	1,543	100	793	10	55
Total.....	8,762	15,886	2,141	5,658	353	939

(A) Surveyed by public land surveyors.

(B) Surveyed by private land surveyors.

NOTE.—The figures appearing in the column for "Surveys Received" include the number of surveys and parcels which were corrected and resubmitted by surveyors.

6. *Work on hand—Isolated land surveys.*—The following table shows comparatively in parcels the progress of verification work on isolated land surveys in the Central Office during the last two years:

Year	On hand	Received	Completed	Cancelled
1937.....	13,712	27,218	29,029	586
1938.....	11,315	37,142	33,302	285

7. *Surveys finally completed.*—The following table shows comparatively the number of isolated land surveys finally completed during the years 1937 and 1938:

Year	Number of surveys	Number of parcels	Area in hectares
1937	12,925	29,029	277,858.66
1938	14,555	33,302	254,892.48

8. *Verification fees for surveys executed by private land surveyors.*—The following shows the comparative collections for verification fees for the last two years:

Year	Number of surveys	Number of lots	Number of corners	Amount
1937	2,919	11,804	120,211	₱10,321.85
1938	4,996	18,389	180,090	16,106.08

CADASTRAL LAND SURVEYS

1. *Projects inaugurated.*—The cadastral projects inaugurated during 1938 were as follows:

Province and municipality	B. L. Cad. No.	Date of inauguration	Probable date of completion	Approximate	
				Number of lots	Area in hectares
DAVAO					
Gulanga Extension	281	1-24-38	6-30-41	2,000	176,000
Compostela	282	2-4-38	12-31-39	368	136,754
Saug	283	6-1-38	12-31-40	2,000	80,000
Kapalong	284	7-1-38	7-1-43	1,000	140,000
Total		4 projects		5,368	482,754

The execution of the cadastral projects listed in the foregoing table was authorized by the Office of His Excellency, the President of the Philippines, on September 7, 1937. The purpose of the survey of the same was primarily to curb the expansion of alien landholdings and public land grabbing in said municipal districts.

2. *Cadastral projects in progress in the field.*—On December 31, 1938, there were 8 cadastral projects in progress in the field,

namely: 6 projects under Act No. 2259, as amended, in the municipalities of Sta. Cruz, Tagum, Guianga, Compostela, Saug and Kapalong, Province of Davao, and 2 projects under Act No. 3327 in Kalibo, Capiz, and Oton, Iloilo.

3. *Cadastral projects completed in the field.*—The field work on 2 cadastral projects completed in 1938 involved 4,515 lots containing a total area of 6,380 hectares, as compared with 3 projects finished in 1937 which comprised 9,540 lots having an area of 170,090 hectares.

4. *Computation of cadastral and public land subdivision surveys.*—During the year 1938, the Bureau of Lands completed the computation work on 16,400 lots covering an aggregate area of 67,610 hectares in various cadastral and public land subdivision projects, as against 25,142 lots with an area of 288,492 hectares completed during the preceding year.

5. *Cadastral survey maps.*—During the year, the work accomplished on cadastral survey maps involved 16,457 lots comprising an area of 59,169 hectares as against 25,178 lots covering an area of 284,953 hectares accomplished during the preceding year.

6. *Progress of cadastral and public land subdivision surveys.*—The cadastral and public land subdivision surveys completed in the field and the survey returns of which were submitted to the Manila Office during the period from 1910 to December 31, 1938, reached a total of 1,415 cases involving 1,165,628 lots with an aggregate area of 4,317,687 hectares.

7. *Cadastral revolving fund collections.*—The collections in 1938 which accrue to the cadastral revolving fund, exclusive of the collections on account of registration proceedings, amounted to ₱302,961.36 as compared with ₱380,886.38 collected during the preceding year.

8. *Collections of cadastral costs.*—The following statement shows comparatively the collections of cadastral costs including charges for monumenting, penalty, interest, miscellaneous service, etc. for the last two years:

Year	Amount
1937	₱415,709.53
1938	331,601.79

BUREAU OF SCIENCE

RESEARCH

1. *Industrial chemical research.*—Experiments begun a number of years ago brought about basic and necessary data for the promotion of numerous industries. There are now Philippine

factories manufacturing paints, varnishes, cement, roofing tiles, and other industrial products from Philippine raw materials.

The construction of pilot plants for the production of commodities developed in the bureau has been continued. These miniature factories are a great help in promoting industries, for they show the public exactly how raw materials are processed into finished commercial products.

2. *Tanning and manufacture of leather.*—As a result of investigations made on the preparation of tanning extracts and the art of tanning, excellent tanning extracts have been made from certain Philippine tanbarks. Hides tanned with these extracts produced leather of excellent quality.

3. *Vegetable oils.*—Investigations on Philippine vegetable oils have shown the possibility of developing edible-oil industries.

Coconut oil has been found to be an excellent material in manufacturing high-grade soaps. Recently the bureau has been very instrumental in the establishment of local soap factories.

Deodorized coconut oil, refined in the bureau, is now being used for canning fish in the Bureau of Science cannery at Estancia, Iloilo. As a substitute for imported vegetable oil the refined coconut oil has given excellent results. The refined oil is also suitable for medical and pharmaceutical purposes.

With the aim of producing new products from coconut oil and of devising new uses for it, researches are now in progress.

4. *Cellulose and paper-pulp industry.*—Researches on cellulose and wood pulp were continued during the year. A method for degumming and bleaching decorticated ramie fiber was perfected. Investigations are in progress on the following: pulping studies of Canton fiber (wild banana); chemical and physical properties of Canton fiber; hand-made paper from local materials, like abacá waste, as a home industry; and commercial products from cellulose.

5. *Forest products (copal resins).*—Researches on forest products were continued. The work was confined mostly to an investigation of Manila copal which is the most important of Philippine resins. These natural resins (copals) are obtained as exudations from forest trees. Copals are used for making varnishes and other commercial products. They have been found to be superior to the manufactured (synthetic) resins.

The method in analyzing copal was improved and pure copal acids were made from the crude resin. Copal samples from the provinces were analyzed during the year. Numerous varnishes and other products were made from copal.

6. *Ceramics*.—Industrial research in the ceramic laboratory has been very successful. The demonstrations given by the bureau on the manufacture of glass bottles and roofing tiles from local raw materials were instrumental in the establishment of a glass factory and another factory for the manufacture of roofing tiles.

Samples of clay from different provinces have been tested to determine their suitability for tile and brick manufacture. Experiments are in progress to ascertain the durability of clay-asbestos shingles made in the bureau.

7. *Dyes*.—The dye laboratory in the bureau after a series of experiments has been able to extract coloring matter from the sawdust of ipil, tanguile, and narra. Experiments on dyeing cotton with this coloring matter gave excellent results. Investigations on the process of dyeing under local conditions and the use of mordants are in progress.

8. *Miscellaneous chemical investigations and other researches*.—Chemical research on a number of other projects is also in progress. Some of the more important of these are the following: the preparation of reducing sugars and alcohol from cassava starch; investigation of Philippine clays for refining vegetable oils; the use of "bonote" liquor as wood dye and as a tannin; corrugated roofing fiber-boards from Philippine raw materials; the oil content of Philippine castor beans from different localities; analysis of Philippine chromite; comparative study of methods for determining rotenone in Philippine derris; service tests of various motor fuels and crankcase lubricants under local conditions; possibilities of fire and waterproofing fiber wallboards intended for roofing; some factors influencing the manufacture of totaquina and quinine sulfate from cinchona bark; and iodine in Philippine seaweeds.

The following other researches are in progress: studies on the industrial possibilities of the different species and strains of Philippine yeasts; the utilization of rice hull for the production of solvents by fermentation; and preparation of wines and other fermented beverages.

9. *Industrial microbiology*.—The following investigations along this line were finished: butyl-acetonic fermentation of cassava and molasses; manufacture of high-grade vinegar from sweet potatoes and cassava; production of ethyl alcohol from cassava and sweet potatoes; and determination of the specific identity and mode of transmission of a new trematode parasite of man.

10. *Fish and Game Administration*.—Researches on fishes, mammals, birds, and marine animals were carried out at various districts in the Philippines. The effects of explosives on fish were also studied.

The motorboat "Science I" made periodical trips to Lingayen Gulf, Palawan, and the Visayas, in connection with the studies on various fishing methods, collection of fishes, survey of breeding grounds, observation of temperature and salinity of sea water, oceanography, patrol and investigation work.

The following investigations were finished: review of Philippine Holocentridæ; fish fry industries of the Philippines; fishery survey of different fishing grounds and cause of depletion in some important places; fishing with luminous lights with finely woven abacá net, known as pukot; pukot fisheries of Laguna de Bay; destructive effect of *Cassiopea* sp. and *Uca* sp. in brackish fishponds; certain animals found destructive to oysters in Bacoor Bay; oyster fishery of Lingayen Gulf; salt industry of the coastal regions of Pangasinan, La Union, Ilocos Sur, and Ilocos Norte; and duck raising and snail fishing in Laguna de Bay, Luzon.

11. *National Museum*.—Several investigations started in 1937 were completed and some are still in progress.

Some of the more important researches in progress are given below:

- (a) Revision of Philippine Lepiota and Philippine Psalliota;
- (b) Ethnographic study of the Bataks of Palawan;
- (c) Studies of the climatic effects on optical lenses;
- (d) Study on brown spots of roasted peanuts;
- (e) Study of hay fever plants and fungi causing skin diseases in the Philippines;
- (f) Ethnographic studies of the Pampangans, Kalingas, Tagbanuans, Ibanags, and Negritos; and
- (g) Study of Philippine leaf hoppers and the control of mosquitoes and houseflies.

INDUSTRIAL ENGINEERING

The following were accomplished along this line during the year: construction of a press to be used in the manufacture of alcohol from cassava; construction of an extractor and a hand press for the totaquina pilot plant; construction of a paper mould and experimental kilns for the manufacture of ceramic products, a pulverizer for cinchona bark, and an adobe incinerator.

SCIENTIFIC LIBRARY

The number of bibliographies and lists of references prepared during the year totalled thirty three. The completion of the "Alphabetical and Classified Lists of Serials Available in the Scientific Library" was the most important undertaking of the Library during the year.

MISCELLANEOUS SERVICE

During the year under review, a great deal of publicity was given to the industrialization of Philippine products. Free demonstrations in the process of making soap and other products were given frequently. Considerable time and effort were devoted by the technical personnel of the bureau to the consultation and demonstration service and to the handling of correspondence in connection with extension work.

As in the previous year, tests on the strength of cement, concrete, and other materials used in the construction of buildings were performed by the Bureau of Science for the Bureau of Public Works; a number of samples of weights and measures standardized and certified for the Bureau of Internal Revenue; and laboratory control and service tests of miscellaneous materials, such as fuels, lubricants, metals, alloys, paints, and waters, made for the Manila Railroad Company.

The analyses of industrial products, such as cement, paints, lubricants, fuels, metals, vegetable oils, and fertilizers sold in the Philippines, were maintained.

The Fish and Game Administration continued extending effective help to the fishing industry in the Philippines. Extension and coöperative work was carried out during the year with the end in view of further improving the fishing industry.

The National Museum Division continued activities along educational lines. It was concerned, not only with the acquisition, preservation, and exhibition of objects of natural history and industry, but also with dissemination of information of their usefulness and application to everyday life. Identifications were made of plants, insects, shells, corals, and other specimens. As usual wax and plaster models of fruits and vegetables were made and numerous birds and animals were mounted. Exchanges of specimens were made with a number of institutions and individuals. A total of 26,504 persons visited the National Museum during the year.

The power plant of the Industrial Engineering Division continued furnishing electric current, steam, air, vacuum, artesian water, and refrigerating service to the bureau, the Philippine General Hospital, and the Colleges of Medicine and Liberal Arts of the University of the Philippines.

The Scientific Library helped in the acquisition of books for, and in the organization of, the libraries of the National Development Co., the Quezon Institute, and the People's Homesite Corporation. The faculty members of various universities were given the usual necessary assistance.

The Photographic Section of the bureau now has 36 large albums containing over 65,000 photographs which depict the customs, habits, and industries of the Filipino people.

RESEARCH PUBLICATIONS

The following research papers were either published or submitted for publication:

1. Decolorizing carbon and water glass from rice hull ash, by A. O. Cruz and A. P. West;
2. A method for degumming and bleaching decorticated ramie fiber, by M. P. Ramiro;
3. Analysis and composition of Manila copal, by S. S. Tanchico and A. P. West;
4. Natural dyes obtained from ipil, narra, and tanguile sawdust, by F. Agcaoili, M. Alde, and R. Cochico;
5. Butyl-acetonic fermentation of cassava and molasses, by M. Tubangui, V. Masilungan, and D. Hipolito;
6. Manufacture of high-grade vinegar from sweet potatoes and cassava, by P. J. Aguila;
7. Determination of specific identity and mode of transmission of a new trematode parasite of man, by M. Tubangui;
8. Cultural and chemical studies of derris grown in the Bureau of Forestry Nursery (in coöperation with the Bureau of Forestry), by J. Marañon, L. Cosme, and M. Sulit;
9. Analysis of Philippine chromite, by R. Oliver and R. Aguilar;
10. Comparative study of methods for determining rotenone in Philippine derris, by J. Marañon and L. Cosme;
11. The properties of cement raw materials from San Fernando, La Union, by R. Simpao and F. Reyes;
12. A new Taenioid fish of Occidental Negros, by H. A. Roxas and G. L. Ablan;
13. A new species of Palaemon from Northern Luzon, by G. J. Blanco;
14. A review of Philippine Holocentridæ, by J. R. Montilla;
15. Birds from Leyte, by D. S. Rabor;
16. Certain animals found destructive to oysters in Bacoar Bay, Luzon, by D. V. Villadolid and D. K. Villaluz;

17. Contributions to the early life history of *Taeniotoxa lateralis* Agassiz, by G. J. Blanco;
18. Fishing with light in Igat Bay and neighboring places, by J. S. Domantay;
19. Fisheries of Northern Luzon including the Babuyan and Batanes Islands, by G. J. Blanco;
20. Five other known species of *Penaeus* in the Philippines, by D. K. Villaluz and F. J. Arriola;
21. Food of some birds about rice fields in the Philippines, by C. G. Manuel;
22. Notes on the invertebrate fauna of Sakul Island Lagoon, Zamboanga, by J. S. Domantay;
23. Notes on some rare inhabitants of brackish fishponds and their injurious effects, by J. S. Domantay;
24. Notes on birds recently collected from the Islands of Palawan and Busuanga, by C. G. Manuel;
25. Notes on the tuna fishery and long line fishing of Davao Gulf, by C. Martin;
26. Observations on the breeding of the dwarf gourami, *Trichogaster lalius* (Ham. & Buch.), by J. S. Domantay;
27. Oyster farming, by D. K. Villaluz;
28. Snail fishing and duck raising in Laguna de Bay, Luzon, by D. K. Villaluz and F. J. Arriola;
29. Philippine mushrooms, by J. M. Mendoza;
30. Studies on the anatomy of the bañgos, *Chanos chanos* (Forskål), by D. S. Rabor;
31. The Littoral Asteroidea of Port Galera Bay and adjacent waters, by H. A. Roxas and J. S. Domantay;
32. The migratory fishes of the Philippines and the problems affecting their conservation, by D. V. Villadolid;
33. The echinoderm fauna of the Masinloc anchorage off Zamboanga, and neighboring places, by J. S. Domantay;
34. The fishing industry of Cotabato and its fishery resources, by J. S. Domantay;
35. The avifauna of the Gigante Islands, by D. S. Rabor;
36. The milkfish (bañgos) fry industry of northwestern Luzon, by G. J. Blanco;
37. The flying-fish fisheries of northwestern and southwestern Cebu, by C. Martin;
38. The diwal fishery of Occidental Negros, by G. L. Ablan;
39. The bisig of Tagoloan River, Misamis Oriental Province, by P. R. Manacop;
40. The transplanting of hipon fry in certain rivers of Misamis Oriental Province, by P. R. Manacop;
41. Two new species of decapod crustaceans of the Philippines, by G. J. Blanco;
42. Two rare Philippine fishes, by C. Martin;
43. Two species of Pinna new to the Philippines, by G. L. Ablan and G. L. Alcasid;

44. Two rare pediculate fishes from the Philippines, by A. G. Agco;
45. Fisheries of northwestern Luzon, by G. J. Blanco;
46. Problems of and adjustments in the fishing industry, by D. V. Villadolid;
47. The fishing industry of Sulu and its fishery resources, by J. S. Domantay;
48. The present pearling industry of Mindanao and Sulu; causes of its decline in the past and the prospect of its future rehabilitation, by J. S. Domantay;
49. The fisheries of Lake Mainit and of northeastern Surigao, including the Islands of Dinagat and Siargao, by P. R. Manacop;
50. A revision of Philippine Lepiota, by J. M. Mendoza and S. Leus-Palo;
51. Studies on Philippine orchids, by E. Quisumbing; and
52. Fish fry industries of the Philippines, by D. V. Villadolid and G. J. Blanco.

BUREAU OF COMMERCE

The following is a brief statement of the activities of the Bureau of Commerce during the year under review:

1. *Trade information service.*—The dissemination of commercial and industrial information and data of practical value to businessmen, industrialists, retailers, farmers, and capitalists desiring to invest in prospective industries or business is one of the major functions of the bureau. This is carried out through its trade information service. During the year, about 7,000 inquiries, oral and written, calling for information and statistics about Philippine industries and commerce were attended to by the bureau. Eighty-six trade opportunity notices were published. This brought about 500 new trade connections between Philippine traders and importers and exporters in the United States, Canada, Peru, Egypt, Venezuela, Turkey, Gold Coast, West Africa, British India, Switzerland, Burma, China, Manchoukuo, Netherlands, Italy, Great Britain, Brazil, Germany, Porto Rico, Mauritius, Hawaii, British East Indies, Virgin Islands, and Dutch East Indies. Over 3,000 business connections between Manila merchants and provincial distributors were likewise accomplished. For the purpose of explaining the services and accomplishments of the bureau, the provincial commercial supervisors held not less than 83 community assemblies throughout the Islands attended by about 50,000 people. Directories of industrial and commercial establishments in the provinces have been prepared for publication in the near future.

2. *Consumers' coöperatives.*—In order to increase Filipino participation in the retail trade of their own country, the promotion of coöperative associations among consumers and retail store owners was carried on with vigor. The first step towards this end was the organization of a central body known as "The Consumers' Coöperative League of the Philippines" which was incorporated and registered on October 18, 1938. The next move was the formation of committees for the organization of provincial chapters. The first chapter organized was the Bureau of Commerce Consumers' Coöperative Association composed of the employees of the Bureau. This chapter has at present 133 members and a capital of ₱496. A store which supplies its members with articles of necessity was opened on November 19, 1938. The next chapter organized was the Union College of Manila Coöperative Store, with 250 members and a capital of ₱1,000. Six chapters are in process of organization in Manila. Provincial commercial supervisors are supervising the organization of local chapters in Pangasinan, Capiz, Cebu, Iloilo, Occidental Negros, Cotabato, Davao, and other provinces.

3. *Agricultural coöperatives.*—Another important function of the Bureau is the promotion and supervision of agricultural coöperative marketing associations, bonded rice warehouses, and agricultural credit coöperative associations. Through the campaign work undertaken by provincial commercial supervisors, six new agricultural coöperative marketing associations were organized and incorporated during the year, making the total number of such associations 160. Several associations are now in process of organization in the Provinces of Abra, Sorsogon, Zamboanga, Tayabas, Marinduque, Laguna, Ilocos Sur and Camarines Sur, and the Mountain Province. These associations made sales of agricultural products valued at approximately ₱8,000,000.

During the year 1938, 106 licenses for the business of receiving rice and/or palay for storage under Act No. 3893 were issued, as against 126 issued the previous year.

Fifty-four out of 569 agricultural coöperative associations have declared dividends amounting to ₱85,671. The collection of overdue loans was intensified and the amount of ₱60,584 due the Agricultural Coöperative Fund was collected during the year. At the beginning of the year, 166 agricultural credit coöperative associations were indebted to the Agricultural Coöperative Fund, of which seven fully paid their accounts during

the year. The outstanding loans, including new loans granted to two associations during the year, now amount to ₱647,309.

4. *Export inspection service.*—The Bureau continued its export inspection service for the benefit of rice and peanut exporters. During the year it issued 78 certificates of inspection on 7,212 sacks of rice and 28,305 sacks of peanuts for export. Inspection fees totalling ₱373 were collected.

5. *Certification of current commodity prices.*—One of the services accomplished by the Bureau during the year was the certification of average current local prices of rice, palay, corn, and building or construction materials in fire- or typhoon-stricken towns and provinces where the existence of public calamity was proclaimed by His Excellency, the President of the Philippines. In connection with the enforcement of Act No. 4164, nine certificates of average commodity prices in the places devastated by typhoons or fires during the month preceding the occurrence of the typhoon or fire were issued by the Bureau.

6. *Marketing of agricultural products.*—Agricultural products valued at ₱4,909 were sold by the Bureau for provincial producers. During the year it sold for provincial consignors 25,451 kilos of copra, 47 bales of leaf tobacco, 96 piculs of centrifugal sugar, vegetable lard, cacao, starch, milk, salt, matches, Chinese tea, potatoes, onions, gasoline, soap, paper bags, cloth, all valued at ₱1,179.

7. *Apprehension of unfair trade practices.*—Several cases of unfair trade practices were apprehended by the Bureau's agents in Manila and in the provinces. In Vigan, Ilocos Sur, two stores were found selling 'Eveleady' flashlight batteries, a violation of the Unfair Competition Law. A cigar pipe branded "Ambar Legitimo" was found in a store in Manila; 553 tins of imitation "Menen" powder were confiscated from a Chinese store in Cebu; a certain person in Manila was found displaying pictures taken by a well-known photographer, ostensibly to profit from the goodwill of the latter's business. The parties concerned were warned to abstain from committing further acts of unfair competition.

8. *Registration of corporations, trade-marks, trade names, patents, etc.*—With the transfer of the function of registering corporations and partnerships from the Bureau of Commerce to the Securities and Exchange Commission, the Bureau's registration activities have since June, 1938 been confined to trade-marks, trade names, and United States Letters Patent. Four

hundred eighty applications for trade-marks and trade names were received and examined, of which 326 were approved and registered. One hundred forty-three were filed by American firms. In addition, three labels not accompanied by application papers were examined.

Sixty-four certified copies of United States Letters Patent were filed in the Bureau of which 39 were owned by American inventors. Eleven assignments of patents were also recorded.

Out of 3,820 applications received for the registration of business names, 3,552 were registered and 73 were rejected either for being in conflict with other names already registered in this Bureau or not permitted by law or regulations. Nine hundred one parties were advised to register their business names, the majority of whom complied with the request. Five proprietors of business establishments were prosecuted for violation of the Business Name Law. The cases are pending in court. Seventy-six aliases were registered, and 269 bulk sales documents were recorded.

9. *Promotion of small and household industries.*—The campaign to increase the sales of Made-in-the-Philippines products was pushed through with greater vigor. The Manila Trading Center, through its Commercial Samples Display Room, extended its services to local manufacturers, other than exhibitors already established in the Center, by displaying representative samples of their products free of charge. It worked for the establishment of better grades or standards of quality for Philippine-manufactured products and assisted Philippine manufacturers in establishing business connections with distributors, local and foreign. In the 1938 Philippine Exposition, the Bureau sold ₱4,726 worth of Philippine-made products. During the celebration of the Made-in-the-Philippines Products Week and the Fifth Anniversary of the Manila Trading Center and Exchange, it sold Philippine products valued at ₱6,076 in the exposition held at the former Monte de Piedad Building. In the Seventh Floating Exposition the exhibitors realized sales amounting to ₱79,541 exclusive of wholesale orders. As a result of the First and Second Rolling Expositions held with the coöperation of the Manila Railroad Company, made-in-the-Philippines products valued at ₱14,600 and ₱31,268, respectively, were sold by the participating manufacturers. The Bureau participated, through its provincial commercial supervisors, in 13 provincial and municipal carnivals, fairs, and expositions wherein local products worth ₱3,820 were sold.

Towards the end of the year the van of the Manila Trading Center was reconditioned in order to peddle representative goods on display and sale in the Trading Center in the various districts of the City and suburbs. This was calculated to intensify the sales campaign in order to aid small Philippine manufacturers and household industries. The traveling store made a total sale of ₱736 in twenty selling days.

10. *Commercial extension service.*—To bring the Bureau closer to the people, the Commercial Extension Service of the Bureau was reinforced. Fourteen more commercial agencies were established during the year, making in all thirty agencies now scattered throughout the Philippines. A realization of the importance of the work of the Bureau's provincial commercial supervisors is rapidly growing. Farmers, manufacturers, and retailers and even provincial and municipal officials now realize that the agents of the Bureau can do much in the promotion of commerce, industries, and agriculture in their respective districts. Among the many things that the provincial commercial supervisors do in behalf of Filipino farmers and businessmen are furnishing quotations on farm products, organizing coöperatives which include marketing, agricultural credit, and consumers' establishing business connections between manufacturers and distributors, promoting the sale of native products, preventing unfair trade practices, and giving suggestions and extending help to beginners in business. The Bureau's agents also take advantage of every opportunity to inform the masses about the social justice program of the administration.

WEATHER BUREAU

1. *Typhoons and depressions.*—There were more typhoons and depressions in 1938 than in 1937. Twenty-six typhoons and thirteen depressions occurred in 1938. They took place as indicated in the following table:

Month	Number of depressions	Number of typhoons
January.....	1	1
April.....		1
May.....		2
June.....	1	2
July.....		8
August.....	6	6
September.....	1	3
October.....	1	6
November.....	3	3
December.....		1
	13	26

2. *Rain stations.*—Through the combined effort and coöperation of the Bureaus of Forestry, Public Works, and Weather, sixty-five rain stations were established in 1938, thus bringing back to life the pluviometric system of the Philippine Islands that was wrecked in the depression of 1933. To enable the City of Manila to cope with the problems linked with the design of sewer-systems and control of floods, there was established in the city a net of rainfall stations covering the watershed of the city at the rate of one rainfall station for every two square miles. These rainfall stations are located at the Good Shepherd College, Balintawak, Caloocan; Colegio Serafico, San Francisco del Monte; Bureau of Animal Industry, Pandacan; Health Office, San Lazaro; and Public Welfare Bureau at Welfareville. In accordance with instructions of His Excellency, the President of the Philippines, there was also established at Burdeos, Polillo Island, a third-class weather station.

3. *Aërological stations.*—During the year the Bureau maintained four aërological stations for obtaining upper wind observations by means of pilot balloons. Aparri, Manila, Cebu, and Zamboanga have a series of two observations each day, weather permitting, throughout the year. The station of Dagupan began operating in October. By the end of November, this station was functioning satisfactorily and at the end of the year 1938, preparations were made for regular ascents twice daily. The number of ascents during the year totalled 665 at Aparri, 729 at Manila, 678 at Cebu, and 665 at Zamboanga.

4. *Earthquakes.*—The total number of seismic disturbances recorded in Manila during the year was 898. Eleven earthquakes, the centers of which were at various distances, were felt in the City of Manila. The total number of earthquakes reported as felt in the Philippines was 177.

5. *Time service.*—The Weather Bureau, through its Astronomical Division, continued the daily transmission of time signals to the telegraph office of the Bureau of Posts, Manila Railroad Company and the United States Naval Station at Cavite.

The correct time was maintained by three master clocks of the Observatory, namely, Short Synchrotime No. 33; Reifler No. 42; and Reifler No. 251. Clocks Nos. 33 and 42 beat Manila Standard Time while clock No. 251 maintains local Sidereal Time.

6. *New apparatuses.*—The following new apparatuses were obtained and put into service during the year: (a) High-speed chronograph; and (b) Mascart self-recording electrometer.

BUREAU OF MINES

DISPOSAL AND ADMINISTRATION OF MINERAL LANDS

As stated in the previous report of this Office, this heading includes disposition of mineral lands by location and lease under the provisions of Commonwealth Act No. 137, the Mining Act, as amended by Commonwealth Act No. 309, and mining grant under the former mining laws which continue to be in force and effect. During the year a total of 5,463 mining locations was made throughout the entire Archipelago, with an aggregate approximate area of 69,570 hectares. Six lode leases, two placer leases, five coal revocable permits, two geological exploration leases, and one petroleum drilling lease were granted during the year. Two coal leases covering a total area of 986 hectares were issued under Coal Land Act No. 2719 of May 14, 1917.

There was a total of 27,670 mining documents registered in the mining registries throughout the Philippines during the year. The total fees collected on these documents amounted to ₱101,133.

SURVEYS OF MINERAL LANDS

The following surveys were completed during the year:

- 973 lode location surveys;
- 7 placer location surveys;
- 183 lode lease surveys;
- 14 placer lease surveys;
- 7 coal lease surveys; and
- 9 coal revocable permit surveys.

Computation was completed on a total of 83 mineral land surveys covering 498 claims, including mining leases, lode location, placer location, coal lease, and coal revocable permits. A total of 2,001 mineral land surveys was finally platted on index sheets. A total of ₱28,641.85 was collected as survey fees from location, mining lease, and coal land surveys executed by the Bureau. This amount constitutes the Special Survey Fund created under the authority of the Secretary of Agriculture and Commerce and the Auditor General.

ADMINISTRATIVE SETTLEMENT OF CLAIMS AND CONFLICTS OVER MINERAL LANDS

The Bureau rendered 71 decisions and orders on claims and conflicts over mineral lands, three of which, upon appeal to the Department, were affirmed. Attorneys of the Bureau coöperated

with the attorneys of the Bureau of Justice in the investigation of cases involving violations of Commonwealth Act No. 108, the Dummy Law.

GEOLOGICAL AND MINES SURVEYS

Geological studies, examination, and investigation were made and conducted on the following: (a) the hydroelectric plant on the Agno River; (b) the proposed dam site for hydroelectric plant on the Caliraya River; (c) the cement plant site for the Cebu Portland Cement Co. in San Fernando, La Union; (d) the Surigao Iron Ore Reservation and the Camarines District; (e) the chromite deposits at Masinloc, Zambales and Lagonoy, Camarines Sur; and (f) the Malangas Coal Deposit.

As part of the campaign to foster safety in mine operation, first aid and safety instructions were given to students of the University of the Philippines and the Safety Inspectors of the Department of Labor.

ASSAY AND METALLURGICAL WORK

The assay laboratory of the Bureau handled during the year 779 samples, including gold bars amounting to ₱1,411,166.28, for fineness determination. The number of samples submitted during the year under review is only one-fourth of the total number of samples received in 1937. This is due to the newly established commercial assay laboratories in the City of Manila.

MINING EXAMINATION AND VALUATION

As in previous years, the valuation of mines and mining claims was undertaken by the Bureau in coöperation with the Securities and Exchange Commission. This work was done in connection with the purchase of mines and mining claims by corporations and applications for permit filed by mining companies to sell or release stocks.

FIBER INSPECTION SERVICE

The downward trend of prices of Philippine fibers which started at the beginning of the year 1938 continued throughout the year. The bottom of the depression as regards the ordinary cordage grades (F and below) was reached about the end of the month of March when "F" was quoted at as low as ₱10.50 per picul and "J2" at ₱7 per picul. These prices recurred several times during the year.

The Davao Region, however, produced a substantial supply despite the unfavorable trend of the market. Abacá balings during the first half of the year were 218,110 bales below those of the corresponding period in 1937, whereas the abacá balings during the second half were 65,312 bales more than the corresponding period in 1937. The total for the year 1938 was 1,151,685 bales as against 1,304,483 bales for 1937.

The Fiber Inspection Service maintained the official standards of the different commercial fibers intended for export. In the work of supervision and inspection of bales of fiber for export the Fiber Inspection Service received effective help from all grading establishments.

To forestall, if not to do away with, the practice of speculating on prices of abacá fiber, the publication of statistical data relative to balings, shipments, and stock beginning July 1, 1938, was suspended. This action brought about as expected protests and requests for the resumption of such publication not only from local exporters but also from dealers in London. As the continued publication of the same would prejudice Philippine fiber producers and small dealers, the suspension thereof has been continued during the year.

1. *Convention of abacá planters.*—The regular general meeting of the "Asociación Nacional de Productores de Abacá, Inc." which was scheduled on the last Saturday of February, 1938, could not be held at that time on account of lack of quorum. For this reason, another meeting was called and held on June 27, 1938, under the auspices of the Fiber Inspection Service. The election of new officers for the year 1938 was held and several resolutions were adopted at this convention.

A convention of educational fiber inspectors was likewise held from February 17 to 19, inclusive. General matters relating to the industry were taken up in this convention.

2. *Fiber grading and inspection.*—The official standards of classification of abacá and other Philippine fibers were maintained through the supervision of the work of grading establishments and the regular inspection of all bales submitted for this purpose by the personnel of the service in the four main district stations in Manila, Cebu, Davao, and Legaspi and the substations operating under them.

During the year, one new inspection district was opened by the Service at Virac, Catanduanes under District No. 4.

At the end of the year, the inspection districts and stations operated by the Fiber Inspection Service were the following:

District	Headquarters	Inspection stations comprised
No. 1	Manila	Manila and Tacloban, Leyte.
No. 2	Cebu	Cebu, Malitbog, and Baybay, Leyte.
No. 3	Davao	Santa Ana, Talomo, Davao, and Madaum, Davao.
No. 4	Legaspi	Legaspi and Tabaco, Albay; Virac, Catanduanes; Tigaon and Sabang, Camarines Sur; and Gubat, Casiguran, and Bulan, Sorsogon.

There were 52 grading establishments in operation during the year distributed as follows:

	<i>Establishments</i>
District No. 1—Manila	
Manila	6
Tacloban, Leyte	2
District No. 2—Cebu	
Cebu	8
Malitbog, Leyte	1
Baybay, Leyte	1
District No. 3—Davao	
Talomo, Davao	1
Davao, Davao	1
Malita, Davao	1
Madaum, Davao	1
Sta. Ana, Davao	5
District No. 4—Legaspi	
Legaspi, Albay	5
Tabaco, Albay	3
Ligao, Albay	2
Virac, Catanduanes	2
Sabang, S. J., Camarines Sur	2
Iriga, Camarines Sur	1
Tigaon, Camarines Sur	3
Sorsogon, Sorsogon	1
Bulan, Sorsogon	2
Casiguran, Sorsogon	2
Gubat, Sorsogon	2

The following is a comparative tabulation of the number of bales of abacá and other fibers which have been inspected and either approved or condemned by Government fiber inspectors during the year 1938, as compared with those of 1937:

	1938			1937		
	O. K.	I. C.	Per cent	O. K.	I. C.	Per cent
Abaca.....	1,151,686	7,778	0.7	1,364,483	13,503	1.0
Deco.....	16,917			14,639	43	0.3
Maguac.....	46,552	80	0.2	123,492	166	0.1
Canton.....	12,292	56	0.5	31,291	167	0.5
Sisal.....	614			5,286		
Pacel.....				898		
	1,228,060	7,914	0.6	1,480,089	13,889	0.9

3. *Educational work.*—The educational campaign launched in the middle part of the year 1937 pursuant to General Memorandum No. 223, dated August 30, 1937, to improve fiber production so as to meet the requirements of the market, local as well as foreign, and to give the producers such other information, including practical demonstration, as will enable them to understand the grades of fiber they prepare as well as the current market price thereof, was continued during the year under review with added vigor. Meetings and demonstrations for the purpose were held in the Provinces of Samar, Ilocos Norte, Capiz, Iloilo, Leyte, Cebu, Surigao, Agusan, Davao, Albay, Sorsogon, Catanduanes, Camarines Norte, Camarines Sur, and Masbate, by and under the supervision of the district inspectors of the Fiber Inspection Service.

DIVISION OF STATISTICS

The bulk of the work accomplished by the Division during the year consisted of collecting, systematizing, and preparing statistics on the following:

- (a) Production and values of nonmetallic products and estimates of livestock population;
- (b) Production, areas planted, and values of crops;
- (c) Number of births and deaths of animals; and
- (d) Meat production and consumption.

It coördinated general statistics for the Philippines, including those on commerce, industry, transportation, demography, natural resources, finance, banking, labor, and mining. Considerable portions of the summaries of the compilations and statistics prepared have been published in the Philippine Statistical Review.

The crop report and forecasting service have been improved as a consequence of the promulgation of Administrative Order No.

7 of the Department on August 21, 1938, which, as stated elsewhere in this report, requires all field employees of the Department, particularly those appointed under the authority of Commonwealth Act No. 85, to furnish necessary data to make possible accurate compilation of statistics.

Among the institutions and offices which availed of the services of the Division are the following:

- (a) National Economic Council;
- (b) National Rice and Corn Corporation;
- (c) National Power Corporation;
- (d) National Research Council;
- (e) National Development Company;
- (f) National Fiber Corporation;
- (g) Departments of the Interior and Finance; and
- (h) American Trade Commissioner and the United States Navy.

The services of the Division are likewise being taken advantage of by foreign institutions.

DIVISION OF PUBLICATIONS

In addition to the five main journals edited and published by the Division of Publications in previous years, namely, the Philippine Journal of Science, the Philippine Journal of Agriculture, the Philippine Journal of Commerce, the Philippine Journal of Animal Industry, and the Philippine Statistical Review, there was edited and published during the year under review the Philippine Journal of Forestry. The Division rendered as usual photographic services for the different bureaus and offices under the Department of Agriculture and Commerce and performed multigraphing, mimeographing, bookbinding, and repair work. As an editorial and general service division of the Department, it continued editing for the bureaus and offices under the Department bulletins and pamphlets issued by them. It either edited or supervised the editing, among others, of the following bulletins and pamphlets.

Bureau of Plant Industry contributions:

- Bureau of Plant Industry Farmers' Circular No. 36—Practical Suggestions for Rural Improvement.
- Bureau of Plant Industry Farmers' Circular No. 5—Commercial Raising of Cabbage.
- Bureau of Plant Industry Farmers' Circular No. 10—Cotton Growing in the Philippines.
- Bureau of Plant Industry Farmers' Circular No. 15—Cigar Wrapper Leaf Tobacco.

Bureau of Plant Industry Farmers' Circular No. 20—Control of Insects and Other Pests.

Bureau of Plant Industry Farmers' Circular No. 30—Rice Bug and Its Control.

Bureau of Plant Industry Farmers' Circular No. 31—Rice Stem Borers and Their Control.

Bureau of Animal Industry contributions:

Bureau of Animal Industry Bulletin No. 5—Las Enfermedades Peligrosas y Contagiosas más Comunes de Animales en Filipinas y su Prevención.

Bureau of Animal Industry Bulletin No. 2—Explanation of Livestock Terms.

Bureau of Animal Industry Bulletin No. 12—Goose Raising.

Bureau of Animal Industry Bulletin No. 11—Turkey Raising.

Bureau of Animal Industry Bulletin No. 8—Lechon Making.

Bureau of Science contributions:

Technical Bulletin No. 10—Useful Plants of the Philippines (Vol. 1).

Popular Bulletin No. 11—Food of Birds about Rice Fields in the Philippines.

Soil Survey Committee contributions:

Soil Report No. 1—Soil Survey of Bulacan Province (reprint).

Soil Report No. 2—Soil Survey of Rizal Province (reprint).

Soil Report No. 3—Soil Survey of Cavite Province (reprint).

Soil Report No. 4—Soil Survey of Batangas Province.

Bureau of Mines contribution:

Technical Bulletin No. 9—Geology of the Baguio Gold District.

Weather Bureau contributions:

Weather Bureau Meteorological Bulletin, May–August, 1937.

Weather Bureau Meteorological Bulletin, September–December, 1937.

Weather Bureau Meteorological Bulletin, January–April, 1938.

Weather Bureau Meteorological Bulletin, May–August, 1938.

Weather Bureau Seismological Bulletin, July–December, 1937.

Weather Bureau Seismological Bulletin, January–June, 1938.

Typhoons Originating in China Sea.

Observations of Rainfall in the Philippines, Supplement No. 1.

Division of Publications contributions:

Technical Bulletin No. 11—Third Ten-Year Index to the Philippine Journal of Science.

Official Guide to the Fifth Agricultural and Commercial Exposition.

Index to Volume 8 of the Philippine Journal of Agriculture.

Brief Instructions for the Preparation of Manuscripts (multi-graphed).

Publications distributed.—The following table shows the number of the publications distributed during the year:

Journals and reviews	26,153
Pamphlets, circulars, etc.	17,493
Bulletins	3,190
Reports	906

BOARD OF EXAMINERS FOR SURVEYORS

1. *Organization.*—The Ninth Board of Examiners for Surveyors was composed of the following:

Mr. Juan Coronado, Chairman
 Mr. Antonio Manahan, Member
 Mr. Teodosio Trinidad, Member

The Chairman and the two members of the Board qualified and assumed office on January 17, 1938, the date they took oath of office.

2. *Meetings.*—The organization meeting of the Board was held in the Office of the Chief, Division of Surveys, Bureau of Lands, Manila, and twenty-one other meetings were held subsequently by the Board during the year.

The following is a résumé of the matters considered by the Board in the said meetings:

- 7 applied for and all took the mineral land surveyor examinations;
- 50 applied for and 49 took the private land surveyor examinations;
- 1 application for private land surveyor examination was disapproved;
- 5 obtained passing grades in the mineral land surveyor examinations;
- 31 obtained passing grades in the private land surveyor examinations;
- 5 administrative cases were heard, three of which were decided against the respondents;
- 4 administrative cases were dismissed;
- 3 administrative cases were dropped; and
- 4 administrative cases were set for hearing but interested parties did not appear on the date the respective cases were set for hearing.

3. *Examinations.*—The Board held special examinations for private and mineral land surveyors on January 27–29, 1938 and regular examinations for private and mineral land surveyors on June 7–9, 1938.

4. *Certificates issued during the year.*—During the year the following eighty certificates were issued by the Board pursuant to the provisions of Act No. 3626 as amended by Act No. 3889:

Mineral land surveyor certificates.....	17
Private land surveyor certificates.....	62
Cadastral land surveyor.....	1

VETERINARY EXAMINING BOARD

1. *Organization.*—Pursuant to General Memorandum Order No. 30-4 of the Honorable, the Secretary of Agriculture and Commerce, the following were appointed members of the Board for the year 1938:

Dr. Teodulo Topacio, Chairman
 Dr. Pedro S. Sales, Member
 Dr. F. F. Turla, Member

It will be observed that no change in the membership of the Board for 1937 was made in 1938.

2. *Applications and examinations.*—The Commissioner of Civil Service conducted the examination given by the Board in his capacity as executive officer under section 10 of Act No. 4007. The Board gave only one examination on May 19-21, 1938 in Manila and in Cebu. Seven applications were received and approved by the Board but only five applicants actually took the examination, all of whom passed. The examination in Cebu was held through a special arrangement with the Examining Division of the Bureau of Civil Service.

3. *Registration.*—Five new veterinarians were registered by the Board during the year under review.

NATIONAL RESEARCH COUNCIL

No report on the accomplishments of the National Research Council is being submitted inasmuch as the jurisdiction over the same was transferred to the Office of the President effective January 1, 1938, by virtue of Commonwealth Act No. 245.

FINANCIAL STATEMENT

The following tables show the comparative statements of expenditures of the Department of Agriculture and Commerce, together with the bureaus and offices under it, from January 1 to December 31, 1938:

DEPARTMENT OF AGRICULTURE AND COMMERCE

Comparative statement of expenditures, period ended December 31, 1938

Item	January 1 to December 31		
	1938	1937	(+) Increase (-) Decrease
	<i>Pesos</i>	<i>Pesos</i>	<i>Pesos</i>
Salaries and wages.....	2,975,119.38	2,291,271.86	+ 683,847.52
Sundry expenses.....	941,813.63	718,939.13	+ 222,874.50
Furniture and equipment.....	226,051.00	35,132.87	+ 190,918.13
Special appropriations.....	698,123.01	509,379.68	+ 188,743.33
Fixed expenditures.....	74,124.28	42,385.78	+ 31,738.50
Indefinite expenditures.....	438.50	303.78	+ 134.72
Expenditures from receipts automatically appropriated.....	61,619.68	35,515.33	+ 26,104.35
Continuing appropriations.....	450,309.51	461,096.78	- 10,787.27
Special and revolving funds.....	1,095,512.03	804,734.48	+ 290,777.55
Grand total.....	6,523,111.02	4,898,759.69	+1,624,351.33

Statement of appropriations and expenditures for the year 1938

	Total appropriation for the year	Total expenditure for the year	Balance at the end of the year
	<i>Pesos</i>	<i>Pesos</i>	<i>Pesos</i>
Total.....	8,438,001.59	6,523,111.02	1,914,890.57

OFFICE OF THE SECRETARY AND SPECIAL DIVISIONS

Comparative statement of expenditures, period ended December 31, 1938

Item	January 1 to December 31		
	1938	1937	(+) Increase (-) Decrease
	<i>Pesos</i>	<i>Pesos</i>	<i>Pesos</i>
Salaries and wages.....	153,783.65	118,675.84	+ 35,107.81
Sundry expenses.....	109,807.55	85,637.84	+ 24,169.71
Furniture and equipment.....	6,587.16	2,602.46	+ 4,284.70
Special appropriations.....		114,000.00	- 114,000.00
Fixed expenditures.....	2,927.30	1,547.75	+ 1,379.55
Indefinite expenditures.....	19.01		+ 19.01
Continuing appropriations brought forward from prior years.....	14,669.00	12,990.38	+ 1,678.62
Special revolving fund.....		15,699.20	- 15,699.20
Grand total.....	288,093.67	351,153.47	- 63,059.80

Statement of appropriations and expenditures for the year 1938

	Total appropriation for the year	Total expenditure for the year	Balance at the end of the year
	<i>Pesos</i>	<i>Pesos</i>	<i>Pesos</i>
Total.....	1,270,159.35	288,093.67	82,065.68

BUREAU OF PLANT INDUSTRY

Comparative statement of expenditures, period ended December 31, 1938

Item	January 1 to December 31		
	1938	1937	(+) Increase (-) Decrease
	<i>Pesos</i>	<i>Pesos</i>	<i>Pesos</i>
Salaries and wages.....	289,799.00	259,552.09	+ 30,246.91
Sundry expenses.....	94,743.62	81,068.08	+ 13,675.54
Furniture and equipment.....	8,577.41	1,738.49	+ 6,838.92
Special appropriations.....	189,364.78	72,100.07	+ 117,264.71
Fixed expenditures.....	11,616.03	8,955.36	+ 2,660.67
Indefinite expenditures.....		.50	— .50
Continuing appropriations.....	39,940.76	128,806.68	— 98,865.92
Special and revolving fund.....	96,396.42	91,089.44	+ 5,306.98
Grand total.....	730,438.02	653,310.71	+ 77,127.31

Statement of appropriations and expenditures for the year 1938

	Total appropriation for the year	Total expenditure for the year	Balance at the end of the year
	<i>Pesos</i>	<i>Pesos</i>	<i>Pesos</i>
Total.....	888,801.05	730,438.02	158,363.03

BUREAU OF ANIMAL INDUSTRY

Comparative statement of expenditures, period ended December 31, 1938

Item	January 1 to December 31		
	1938	1937	(+) Increase (-) Decrease
	<i>Pesos</i>	<i>Pesos</i>	<i>Pesos</i>
Salaries and wages.....	287,000.15	224,472.10	+ 62,528.05
Sundry expenses.....	93,190.75	74,673.20	+ 18,517.55
Furniture and equipment.....	13,073.98	1,673.14	+ 11,400.84
Special appropriations.....	103,976.98	88,581.81	+ 15,395.17
Fixed expenditures.....	7,723.75	3,270.81	+ 4,452.94
Indefinite expenditures.....	39.50	8.31	+ 31.19
Continuing appropriations brought forward from prior year.....	24,746.54	25,253.46	— 506.92
Special funds under special acts.....	274,702.94	103,973.65	+ 170,729.29
Grand total.....	804,454.59	521,906.48	+ 282,548.11

Statement of appropriations and expenditures for the year 1938

	Total appropriation for the year	Total expenditure for the year	Balance at the end of the year
	<i>Pesos</i>	<i>Pesos</i>	<i>Pesos</i>
Total.....	913,371.54	804,454.59	108,916.95

BUREAU OF FORESTRY

Comparative statement of expenditures, period ended December 31, 1938

Item	January 1 to December 31		
	1938	1937	(+) Increase (-) Decrease
	<i>Pesos</i>	<i>Pesos</i>	<i>Pesos</i>
Salaries and wages.....	683,964.78	559,519.76	+130,445.02
Sundry expenses.....	173,534.12	116,898.12	+ 56,636.00
Furniture and equipment.....	20,560.20	2,828.00	+ 17,732.20
Special appropriations.....	305,810.25	46,610.40	+259,199.85
Fixed expenditures.....	15,653.31	9,495.24	+ 6,158.07
Indefinite expenditures.....			
Expenditures from receipts automatically appropriated.....	10,033.28	4,123.07	+ 5,905.21
Continuing appropriations brought forward from prior years.....	146,395.95	100,695.70	+ 45,700.25
Grand total.....	1,355,951.89	834,175.29	+521,776.60

Statement of appropriations and expenditures for the year 1938

	Total appropriation for the year	Total expenditure for the year	Balance at the end of the year
	<i>Pesos</i>	<i>Pesos</i>	<i>Pesos</i>
Total.....	1,439,073.34	1,355,951.89	83,121.95

BUREAU OF LANDS

Comparative statement of expenditures, period ended December 31, 1938

Item	January 1 to December 31		
	1938	1937	(+) Increase (-) Decrease
	<i>Pesos</i>	<i>Pesos</i>	<i>Pesos</i>
Salaries and wages.....	891,986.38	717,768.30	+174,218.08
Sundry expenses.....	213,516.76	176,146.54	+ 37,370.22
Furniture and equipment.....	20,347.17	12,062.91	+ 8,284.26
Special appropriations.....	116,337.45	124,104.91	- 7,767.46
Fixed expenditures.....	21,773.49	12,355.84	+ 9,417.65
Indefinite expenditures.....	217.52	19.56	+ 197.96
Expenditures from receipts automatically appropriated.....	4,380.51	4,689.86	- 309.35
Continuing appropriations brought forward from prior years.....	151,956.07	75,385.30	+ 76,570.77
Special and revolving funds.....	448,534.72	379,893.77	+ 68,640.95
Grand total.....	1,869,050.07	1,502,426.99	+366,623.08

Statement of appropriations and expenditures for the year 1938

	Total appropriation for the year	Total expenditure for the year	Balance at the end of the year
	<i>Pesos</i>	<i>Pesos</i>	<i>Pesos</i>
Total.....	2,355,033.45	1,869,050.07	485,983.38

BUREAU OF SCIENCE

Comparative statement of expenditures, period ended December 31, 1938

Item	January 1 to December 31		
	1938	1937	(+) Increase (-) Decrease
	Pesos	Pesos	Pesos
Salaries and wages.....	249,633.69	202,867.00	+ 46,766.69
Sundry expenses.....	123,733.33	111,577.88	+ 12,155.45
Furniture and equipment.....	70,327.46	6,152.08	+ 64,175.38
Special appropriations.....	68,302.85	51,578.66	+ 16,724.20
Fixed expenditures.....	5,907.52	2,979.78	+ 2,927.74
Indefinite expenditures.....	162.47	189.97	- 27.60
Expenditures from receipts automatically appropriated.....	47,205.89	26,697.40	+ 20,508.49
Special and revolving funds.....		16,996.88	- 16,996.88
Grand total.....	518,067.53	419,039.55	+ 99,027.68

Statement of appropriations and expenditures for the year 1938

	Total appropriation for the year	Total expenditure for the year	Balance at the end of the year
	Pesos	Pesos	Pesos
Total.....	598,180.31	565,273.22	32,907.09

BUREAU OF COMMERCE

Comparative statement of expenditures, period ended December 31, 1938

Item	January 1 to December 31		
	1938	1937	(+) Increase (-) Decrease
	Pesos	Pesos	Pesos
Salaries and wages.....	139,358.74	119,827.92	+ 19,530.82
Sundry expenses.....	53,465.77	40,387.10	+ 13,078.67
Furniture and equipment.....	10,835.55	3,501.60	+ 7,333.95
Special appropriations.....		1,895.40	- 1,895.40
Fixed expenditures.....	3,151.29	2,120.45	+ 1,030.84
Indefinite expenditures.....		85.44	- 85.44
Special and revolving funds.....	51,084.69	48,008.28	+ 3,076.41
Grand total.....	257,896.04	215,826.19	+ 42,069.85

Statement of appropriations and expenditures for the year 1938

	Total appropriation for the year	Total expenditure for the year	Balance at the end of the year
	Pesos	Pesos	Pesos
Total.....	271,445.20	257,896.04	13,549.16

WEATHER BUREAU

Comparative statement of expenditures, period ended December 31, 1938

Item	January 1 to December 31		
	1938	1937	(+) Increase (-) Decrease
	<i>Pesos</i>	<i>Pesos</i>	<i>Pesos</i>
Salaries and wages.....	113,442.59	94,888.85	+ 18,553.74
Sundry expenses.....	37,787.70	32,550.37	+ 5,237.33
Furniture and equipment.....	24,181.70	4,574.19	+ 19,607.51
Special appropriations.....		14,633.47	- 14,633.47
Fixed expenditures.....	2,963.23	1,660.55	+ 1,302.68
Continuing appropriations.....		2,001.31	+ 2,001.31
Grand total.....	178,375.22	150,608.74	+ 28,366.48

Statement of appropriations and expenditures for the year 1938

	Total appro- priation for the year	Total ex- penditure for the year	Balance at the end of the year
	<i>Pesos</i>	<i>Pesos</i>	<i>Pesos</i>
Total.....	188,265.17	178,379.22	9,889.95

BUREAU OF MINES

Comparative statement of expenditures, period ended December 31, 1938

Item	January 1 to December 31		
	1938	1937	(+) Increase (-) Decrease
	<i>Pesos</i>	<i>Pesos</i>	<i>Pesos</i>
Salaries and wages.....	166,150.40	81,370.91	+ 84,779.49
Sundry expenses.....	42,034.03	16,779.17	+ 25,254.86
Furniture and equipment.....	51,260.37	3,094.56	+ 48,165.81
Fixed expenditures.....	2,408.36	594.27	+ 1,814.09
Grand total.....	261,853.16	101,838.91	+ 160,014.25

Statement of appropriations and expenditures for the year 1938

	Total appro- priation for the year	Total ex- penditure for the year	Balance at the end of the year
	<i>Pesos</i>	<i>Pesos</i>	<i>Pesos</i>
Total.....	265,605.79	261,853.16	3,652.63

FIBER INSPECTION SERVICE

Comparative statement of expenditures, period ended December 31, 1938

Item	January 1 to December 31		
	1938	1937	(+) Increase (-) Decrease
	<i>Pesos</i>	<i>Pesos</i>	<i>Pesos</i>
Salaries and wages.....	158,438.53	127,061.73	+ 31,376.80
Sundry expenses.....	21,853.79	19,127.99	+ 2,725.80
Furniture and equipment.....	1,191.00	511.19	+ 679.81
Fixed expenditures.....	4,042.40	2,372.35	+ 1,670.05
Grand total.....	185,525.72	149,073.26	+ 36,452.46

FIBER INSPECTION SERVICE—Continued

Statement of appropriations and expenditures for the year 1938

	Total appro- priation for the year	Total ex- penditure for the year	Balance at the end of the year
	Pesos	Pesos	Pesos
Total.....	204,016.89	185,525.72	18,491.17

RECOMMENDATIONS

The Department of Agriculture and Commerce with the means and facilities at its command has always endeavored to make its activities of utmost utility to the people in the solution of their economic problems. Undoubtedly, the results of its manifold activities have contributed in a large measure to the advancement of science, agriculture, and industry in the country. It is felt, however, that at the present stage of the country's economic development, the efficiency and usefulness of the Department should be enhanced by all possible means. For this purpose the following recommendations are respectfully submitted:

1. Reorganization of the Bureau of Lands with a view to simplifying and expediting action on land conflicts threshed out in the said Bureau.

2. Purchase of speed boats for the use of this Department in its campaign to curtail or at least minimize illegal fishing within the territorial waters of the Philippines.

3. Disposition by sale of the premises and buildings presently occupied by the Bureau of Plant Industry and acquisition with the proceeds thereof of a larger and more ideal site to which the Bureau of Plant Industry may be transferred so as to provide adequate space for its expanding activities.

4. Sending of more technical men abroad to study the progress in science and the advances in industries made in other countries of the world.

5. Increased appropriation for the different bureaus and offices under this Department so that adequate facilities may be secured and the forces strengthened to cope with the expanding activities of the Department in line with the country's economic development program.

6. Establishment of a School of Fishery for the training of Filipino citizens in modern and scientific methods of fishing and other phases of marine products utilization, especially in the line of deep-sea fishing.

7. Support of the Administration for the following bills submitted by this Department which embody changes for the improvement of the service:

- (1) Bill authorizing the President of the Philippines to sell certain Insular Government properties in the City of Manila, and to dispose, expend, and/or invest the proceeds of the sale thereof for the benefit of the Bureau of Plant Industry.
- (2) Bill providing for the establishment and operation of a Central Agricultural Experiment Station and regional experimental stations and substations, and appropriating funds therefor.
- (8) Bill providing for the promotion of the horse industry in the Philippines through the establishment, equipment, maintenance, and operation of breeding stations and stock farms for horses and providing funds therefor, and through compulsory castration of undesirable horses and prescribing penalties for failure to castrate the same.
- (4) Bill creating an Institute of Scientific and Industrial Research (Bureau of Science).
- (5) Bill requiring inspection of all timber and lumber exports by the Bureau of Forestry and providing for necessary personnel therefor. The main purpose of this Act is to safeguard the Philippine lumber industry and stop complaints received from foreign importers from time to time to the effect that Philippine lumber received by them from local exporters is not properly graded.
- (6) Bill amending section 1829 of the Revised Administrative Code. The purpose of this amendment is to make the provisions applicable not only to forest lands but also to all private woodlands in conformity with section 13 of the same Code and to enable the Government to collect forest charges from agricultural lands where timber is found and forest products gathered.
- (7) Bill further amending section 2751 of the Revised Administrative Code, as amended by Act No. 3314. The object of the amendment is to provide graduated and increased penalties for illegal occupation of forest lands and destruction of forest growth.
- (8) Bill amending sections 1 and 3 of Commonwealth Act No. 304, entitled "An Act to provide for the reforestation and afforestation of watersheds, denuded areas, and cogen or open lands within forest reserves, communal forests, national parks and timberlands, sand dunes, and other public forest lands, in the Philippines, and providing the necessary funds therefor."
- (9) Bill consolidating the administration of public lands suitable for pasture in the Bureau of Forestry, regulating their occupancy and use, etc.

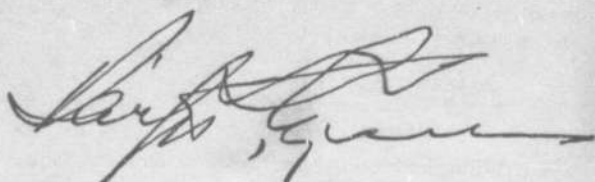
- (10) Bill amending section 9 of Commonwealth Act No. 192 by making collections in the National Produce Exchange available for its operating expenses.
- (11) Bill providing a fixed unit of weight and measure for rice and palay, and prescribing penalties for violations thereof, etc.
- (12) Bill amending section 71 of Act No. 1459, known as the Corporation Law, by adding thereto a provision requiring corporations not formed, organized, or existing under the laws of the Philippines, duly licensed to do business in the Philippines, to submit yearly to the Director of Commerce, certain reports and statements regarding their financial conditions, etc.
- (13) Bill declaring misbranded and mislabelled articles prohibited articles, defining mislabelling and misbranding, declaring misbranded and mislabelled articles subject to seizure and destruction, designating the Director of Commerce as administrator of the Act, punishing resistance to the Director of Commerce and his agents, making the necessary appropriations, etc.
- (14) Bill authorizing the Secretary of Agriculture and Commerce to establish, adopt, and prescribe national official standards and classifications of agricultural products, to enforce the provisions of the same and appropriating funds therefor.
- (15) Bill amending Commonwealth Act No. 331 entitled "An Act authorizing the President of the Philippines, in aid of the establishment and operation of a petroleum and natural gas industry, to call bids and award and execute contracts for the exploration, exploitation and development of petroleum and natural gas deposits in private and public lands in the Philippines, subject in all cases to the express approval of the National Assembly."
- (16) Bill amending section 6 of Act No. 3626, as amended, entitled "An Act to regulate the practice of surveying, create a Board of Examiners for Surveyors, define its powers and duties, and appropriating funds for this purpose."
- (17) Bill amending sections 1777, 1779, 1782, 1783 and 1786 of the Revised Administrative Code, as amended by Act No. 3263 and section 31 of Act No. 4007, concerning fiber grading permits, registration of marks, and baling of fibers for export.
- (18) Bill amending Act No. 2590 to make more effective the protection and conservation of game and birds.

ACKNOWLEDGMENTS

The appointment of the undersigned to this Department during the latter part of the year under review has afforded him an

opportunity to submit this report on the activities and accomplishments of this Department and make public in writing his personal appreciation for the cordial attitude accorded him by His Excellency, the President of the Philippines, and the Secretaries and Directors of other departments and bureaus of the Commonwealth. The undersigned also wishes to make personal acknowledgment of the unselfish cooperation and loyalty of the Under Secretary of Agriculture and Commerce, directors of bureaus, and chiefs of offices under this Department, including its humblest employees, who have creditably discharged their respective duties.

Respectfully submitted,



Secretary of Agriculture and Commerce

○

